

US EPA ARCHIVE DOCUMENT

**Site Re-assessment  
Report**

**Chicago Heights Blvd VOC Plume Site**

**St. Louis County, Missouri**

**December 19, 2001**

**MOSEFN0703551**



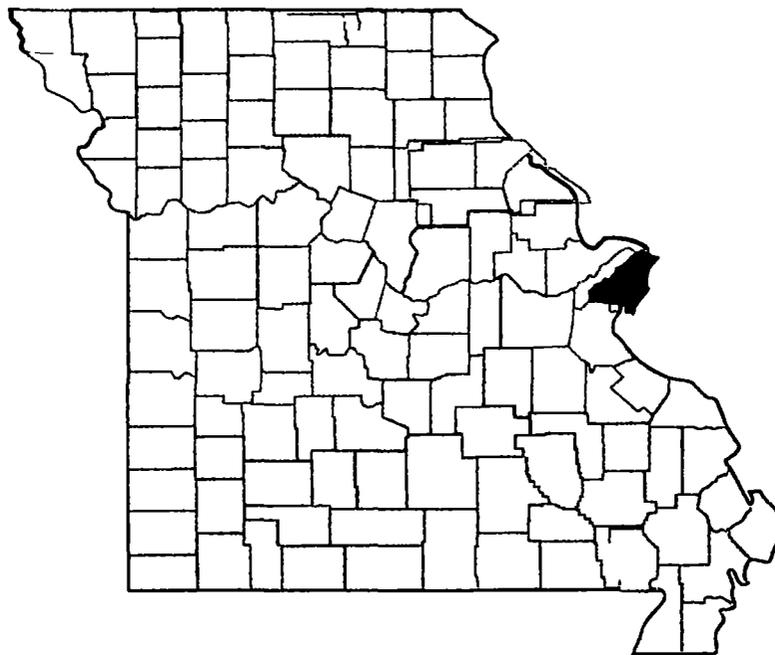
Missouri Department of Natural Resources  
Air and Land Protection Division  
Hazardous Waste Program



# **SITE RE-ASSESSMENT REPORT**

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**DATE:** December 19, 2001

**PREPARED BY:** Nancy H. Priddy  
Missouri Department of Natural Resources

**SITE:** Chicago Heights Blvd VOC Plume  
St. Louis County, Missouri

**EPA ID NUMBER:** MOSFN0703551

**C.A. NUMBER:** V997381-01

## 1.0 INTRODUCTION

Under the authority of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), the Missouri Department of Natural Resources (the department), through a cooperative agreement with the U.S. Environmental Protection Agency (EPA), conducted a Site Re-assessment (SR) at the Chicago Heights Boulevard VOC Plume site. The Chicago Heights Boulevard VOC Plume site is the location of a groundwater plume of volatile organic compounds (VOCs).

The purpose of the SR was to collect additional information concerning conditions at the site to assess the threat posed to human health. In March 2000 a Combined Preliminary Assessment/Site Inspection (PA/SI) was completed for the site. Although the groundwater is not known to be used for household purposes, most basements in the site area have sump pumps which collect water that has drained from around the outside of the house and/or has seeped into the basements through cracks in the foundations. At the time of the PA/SI, drought conditions prevailed and the water table was lower than normal, preventing adequate in-door air and sump water sampling in residential basements. The SR was initiated to determine if residents in the path of the plume are being exposed to VOC vapors entering their basements. The scope of the SR investigation included reviewing file information, sampling environmental media, obtaining a Health Consultation on the sampling data and collecting non-sampling information. The SR was initiated on February 21, 2001 and included a public meeting on April 23, 2001 and a sampling event on April 24, 2001.

## 2.0 SITE DESCRIPTION

### 2.1 Location

The Chicago Heights Blvd VOC Plume site is located in an area between Meeks Boulevard and Chicago Heights Boulevard in an unincorporated segment of St. Louis County, Missouri near Overland. The site is located in the Southeast Quarter (SE 1/4) of the Northeast Quarter (NE 1/4) of Section 31, Township 46 North, Range 6 East in St. Louis County (See Figure 1 in Appendix A) (Reference 3). The geographic coordinates for the site are 38°41'5" N latitude and

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-90°22'48" W longitude, calculated from the northeast corner of the intersection of Chicago Heights Boulevard and Elmridge Place. To reach the site from the junction of U.S. Highway 170 and Page Avenue in Overland, travel west on Page Avenue to Dielman, south on Dielman to Meeks Boulevard, west on Meeks Boulevard to Elmridge Place, and south on Elmridge Place to Chicago Heights Boulevard (Reference 4, p. 1).

The consistent pattern of climate in St. Louis County is cold winters and long, hot summers. The average temperature in winter is 33° Fahrenheit (F) with an average daily minimum temperature of 24° F. In summer, the average temperature is 77° F with an average daily maximum temperature of 87° F. The prevailing wind is from the south with an average speed of 9 miles per hour. The long-term average annual precipitation is approximately 35 to 36 inches. The 2-year, 24-hour rainfall for the area is approximately 2.51 inches (Reference 4, p. 2).

### **2.2 Site Description (Reference 4, p. 2)**

The Chicago Heights Boulevard VOC Plume lies beneath a residential neighborhood that consists of both single family and multi-family dwellings. The surface of the site is relatively flat on the south and east, but gently sloping upward toward the northwest. Approximately 35 individual homes and 12 apartment buildings are located in the area of the groundwater plume. Residential yards are mostly grass-covered.

Many of the residences have basements with sump pumps. External pipes drain water from beneath the basement floor and from around the foundation walls to reduce the water pressure that causes leakage into the basements. The water drains into the sumps inside the basements and then is pumped out of the sumps. The water leaving the sumps is disposed of in either of two ways. Some systems pump the water out through a drainpipe that goes some distance from the house and empties into a gravel-filled pit in the subsurface, where it percolates back into the ground. Other systems pump the water out through a drainpipe that empties into the street at the curb, where the water eventually reaches the storm sewer (Reference 8).

The site area is approximately 15 acres in size. It is generally bounded on the north by Meeks Boulevard, on the east by Werremeyer Place, on the south by a railroad right-of-way, which lies south of Chicago Heights Boulevard, and on the west by a chain-link fence separating the neighborhood from an adjacent business and an open field. The neighborhood lies within a heavily urbanized area, surrounded by various industrial and commercial businesses. A large building is under construction north and northeast of the site, north of Meeks Boulevard. A metals fabrication facility is situated on the north side of Meeks Boulevard, north and northwest of the site. A group of rental storage units also lies northwest of the site. West of the site lies a taxi service and an open field. The south side of the site is adjacent to railroad tracks and commercial buildings facing Dielman Rock Island Drive, north of the River Des Peres. Additional residences and a neighborhood park lie east of the site area. Figure 2 in Appendix A is a site sketch. Photos of the site area can be found in Appendix E.

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### **2.3 Site History and Previous Investigations**

Chlorinated solvents were first discovered in the groundwater beneath the Chicago Heights Boulevard neighborhood in the summer of 1998, during an environmental investigation that was conducted for a nearby hazardous waste site. After additional sampling during the summer of 1999 failed to establish a clear migration route, the Chicago Heights Boulevard VOC Plume site was referred to the department's Hazardous Waste Program (HWP)/Superfund Section's Site Evaluation Unit (SEU) for further evaluation. Although the groundwater in the site area is not used as a drinking water source, there was concern that downgradient residences with basements could be subject to vapors from the groundwater that enters the basements or from vapor migration through walls (Reference 4, p. 2-3).

Two hazardous waste sites are known to exist in the immediate vicinity of the Chicago Heights Boulevard VOC Plume site: The PerkinElmer (formerly EG&G/Missouri Metals Shaping Company) site located north and northwest of the site at 9970 Page Boulevard in Overland, Missouri, and the All American Life Insurance Company site located south of the site at 9479 - 9495 Dielman Rock Island Drive in Olivette, Missouri. In addition, area residents have reported that at one time there was an old dump at the south end of Elmridge Place, near the River Des Peres and that an un-named company dumped material in this area (Reference 4, p. 3).

#### **2.3.1 All American Life Insurance Company (Reference 4, p. 3-4)**

The All American Life Insurance Company site is located south of the Chicago Heights Boulevard VOC Plume site, at 9479-9495 Dielman Rock Island Drive in Olivette, Missouri (see Figure 2 in Appendix A). The site is 1.75 acres in size and contains one single-story multi-tenant office/warehouse building that was constructed in 1985. Historically, the area was occupied by residences until it was cleared for commercial development in the 1960s. Apparently some type of small scale dumping occurred on the property in the mid-1960s.

Groundwater sampling conducted at this site in May 1996, following a Phase I Environmental Assessment, found petroleum related compounds and chlorinated VOCs present including 117 parts per billion (ppb or ug/L) trichloroethylene (TCE) and 38.1 ppb tetrachloroethylene (PCE). The All American Life Insurance Company entered the department's Hazardous Substance Environmental Remediation Program in October 1996 for the remediation of contaminants under the review and oversight of the department. This program is more commonly known as the Voluntary Cleanup Program (VCP). Numerous site characterization investigations were conducted at the site by Environmental Solutions. One of the conclusions in the Phase II Environmental Site Assessment report, dated March 18, 1997, was that the groundwater flow was southward, and that the PCE and TCE contamination was found only in the groundwater, not in the soil, and appeared to be migrating to the site. Petroleum related compounds and lead contamination in the soil and groundwater were also found at the site during these investigations. VCP personnel agreed with Environmental Solutions' conclusion that groundwater and soil data showed that the PCE, TCE, and cis-1,2-dichloroethylene (cis-1,2-DCE) contaminants in the groundwater were originating off-site at an upgradient source. However, investigation and

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remediation efforts continued in an effort to address the other contamination on the site. The All American Life Insurance Company officially withdrew from the VCP in June 1999 without completing cleanup.

### **2.3.2 PerkinElmer (formerly EG&G/Missouri Metals Shaping Company) (EPA No. MOD006283808) (Reference 4, p. 4-5)**

The PerkinElmer (former EG&G/Missouri Metals Shaping Company) site is a metals fabrication facility located north of the Chicago Heights Boulevard VOC Plume site, at 9970 Page Boulevard in Overland. The facility has been in operation since 1957 under various ownership manufacturing aircraft component parts. The site is approximately 3.5 acres in size. Metals and organics contamination was identified in the soil at the site during a Site Inspection in 1988. VOCs were first detected in the groundwater at the site during a property transfer audit at the time EG&G acquired the property in 1988. Comprehensive groundwater sampling conducted for EG&G by Groundwater Technology, Inc. in January 1991 reported TCE present at concentrations up to 32 parts per million ( ppm or mg/L), PCE at concentrations up to 30 ppm, and total VOCs at concentrations up to 210 ppm in the groundwater beneath the site. The department proposed the site for the *Registry of Confirmed Abandoned or Uncontrolled Hazardous Waste Disposal Sites in Missouri* in September 1991. EG&G appealed the proposal and subsequently negotiated a Consent Agreement between EG&G and the department for cleanup of the site. The Consent Agreement was finalized in 1994. Various remedial investigations and activities have taken place at the site since 1991; however, until 1998, off-site contamination had not been evaluated.

In January 1998 the department expressed concerns over the VOC contaminant levels and the potential for off-site migration. Since the groundwater in the area is not being used for drinking water, the primary concern was the possibility of contaminated groundwater causing vapor migration into nearby homes downgradient of the site. On behalf of EG&G, Burns and McDonnell Waste Consultants, Inc. (BMWCI) conducted off-site soil gas sampling in August 1998 and detected chlorinated solvents in the soil and groundwater downgradient of the EG&G facility, in the northern edge of the residential area. During that investigation the department collected groundwater samples from two of the probe holes and found chlorinated solvents in one of the samples at concentrations as high as 25 ppm TCE. In November 1998, BMWCI collected indoor air samples in the basements of four residences in the downgradient neighborhood. No VOCs were detected in any of the air samples. However, TCE was detected at an estimated 4.0 ppb in one water sample that was collected from a sump in one of the residences.

During July and August 1999, BMWCI conducted an Additional Off-Site Investigation to locate and transect the groundwater plume between the EG&G site and the southern boundary of the residential area. This investigation included both subsurface soil and groundwater sampling in the residential area that is now the Chicago Heights Blvd VOC Plume site. None of the soil samples from the soil borings contained the VOCs of concern. Piezometric data indicated that

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the groundwater gradient is generally to the southeast from the EG&G site and across the residential area. Groundwater samples from four temporary piezometers located in the southern portion of the residential area contained TCE and PCE; however, the water samples from seven piezometers located farther north toward the EG&G site were non-detect for the EG&G site-related contaminants. Figures 1 through 5 in Appendix B show the piezometer locations and sample results. Tables 1 and 2 in Appendix B present piezometer data. BMWCI's Additional Off-Site Investigation Report submitted to EG&G concluded that the contaminants present in the southern portion of the residential area had not migrated from the EG&G site, but probably came from a separate source.

### **2.3.3 Combined Preliminary Assessment/Site Inspection (Reference 4)**

On March 28, 2000 the department's HWP completed a Combined PA/SI report for the Chicago Heights Boulevard VOC Plume site. PA/SI sampling was designed to determine the location and the probable source of the VOC plume. Temporary monitoring wells were installed in 26 locations throughout the site. Total depths ranged from 17.0 feet to 29.2 feet. Water sample collection was complicated by drought conditions and several of the wells could not be sampled. PA/SI sampling documented the presence of a high concentration of TCE and PCE in wells on the north and low concentrations in wells on the south and in several wells in-between. Highest concentrations were 1,140 ppb TCE and 716 ppb PCE in wells adjacent to Meeks Boulevard on the north side of the site. A hydrogeologic review of the analytical data from the PA/SI sampling and previous investigations concluded that groundwater contamination from the EG&G site seems to be migrating in a relatively tight pattern off-site into the northern residential area, and that a significant preferential subsurface pathway exists that is influencing that migration. The hydrogeologic review also concluded that it was possible, although highly unlikely, that the contaminants in the southwest corner of the residential area could have originated from a source other than the EG&G site. Figure 1 in Appendix C shows temporary well locations and sample results. Tables 1 through 3 in Appendix C present temporary well information, sample listing/descriptions and analytical results.

### **Groundwater Pathway**

The threat to human health from drinking water appeared minimal; therefore, no drinking water wells were sampled during the PA/SI investigation. Although the perched groundwater in the surficial soils at the site is known to contain VOCs, the water is not used as a source of drinking water. The area's population relies on drinking water supplied by the St. Louis County Water Company, which obtains all its water from surface water intakes on the Missouri and the Meramec Rivers. Any private drinking water wells that may still be in use within four miles of the site appear to draw water from the Mississippian aquifer. There could be some recharge from the contaminated perched water to the Pennsylvanian aquifer; however, recharge from the Pennsylvanian aquifer to the Mississippian aquifer below is not expected. Thirty wells are on record within four miles of the site; however, it is unlikely that many of them are still in use. The nearest downgradient drinking water well on record is located approximately 1.7 miles south of the site.

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Although the threat to human health from drinking water was minimal, the residences with basements in the path of the VOC plume are subject to a potential threat from vapors from the contaminated water that enters the basements or from vapor migration through walls. Air and water sampling within basements was recommended for homes in the path of the plume, where VOC concentrations were at levels of concern.

### Surface Water Pathway

The threat to human health and the environment from run-off to surface water was minimal. The site consists of a contaminated groundwater plume that is migrating from off-site. The contaminants are not known to be present in the shallow surface soils. Although seepage of contaminated groundwater may discharge into the intermittent River des Peres south of the site, the probable point of entry to surface water is more than two miles downstream from the site.

### Soil Exposure and Air Pathway

The risk from soil exposure and airborne soil particles at the site appeared negligible. There is no known source of contamination in the surface soils to which residents and the nearby population could be exposed. There is a potential threat to some residents from inhaling VOC vapors within residences, as discussed in the Groundwater Pathway section.

The PA/SI report concluded that no further investigation of the source of the plume was necessary; however, additional sampling of in-door air in residential basements was warranted. At the time of the PA/SI sampling event, drought conditions had caused basements to be dry and no water was present in basement sumps. The PA/SI report recommended that sampling take place during a time when wetter conditions prevail.

### **2.3.4 PerkinElmer Phase II Off-Site Monitoring Well Installation (Reference 5)**

On February 26 through March 2, 2001, BMWCI oversaw the installation of four bedrock monitoring wells within the residential area, and collected water samples from those wells and from two previously installed monitoring wells. The well installation and sampling activities were conducted to determine the extent of contamination present in the shallow bedrock unit downgradient from the PerkinElmer site. Monitoring Well 19 (GMW-19) and GMW-20 had been installed in August 2000 and were completed within the siltstone unit located just below the overburden at the site, at a depth of approximately 34 feet. The four additional monitoring wells, GMW-21 through GMW-24, were completed at a similar depth. Groundwater samples were collected from all six wells on March 2, 2001. On March 6, 2001 water level measurements were taken from all six wells to determine the overall groundwater flow direction. Groundwater analytical results showed TCE present in all monitoring wells. PCE was present in all but one of the wells and cis-1,2-DCE was present in four of the wells. Well locations and TCE and PCE concentrations are illustrated in Figure 1 of Appendix D. Piezometric surface elevations indicated the general direction of groundwater flow for the aquifer within the siltstone unit is northwest to southeast. The overlying silty-clay formation has the same general groundwater flow direction (see Figures 2 and 3 in Appendix D).

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### **3.0 SUMMARY OF ADDITIONAL WORK (Reference 6)**

On April 24, 2001, as part of the SR, department personnel collected sump water and indoor air samples from residences in the northern part of the neighborhood, where VOC concentrations in the groundwater were known to be the highest and where access to sample could be obtained. Access to sample was not gained for the house closest to the PerkinElmer site. That house is located south of Meeks Boulevard and east of Elmridge Place, at the intersection of Meeks Blvd and Elmridge Pl.

#### **3.1 Sump water sampling**

Water samples were collected from the basement sumps of five residences. Sample locations are indicated on Figure 2 in Appendix A.

All water samples were submitted for volatile organics analysis. Instructions were relayed to analytical personnel that if a sample's total analyte results were 80% of twenty times the Toxicity Characteristic Leaching Procedure (TCLP) regulatory limit, TCLP analysis would be performed on that sample. Analytical results can be found in Table 1 in Appendix A.

Sample analyses showed five VOCs present, three of which are related to the known VOC plume. TCE was present in Sample #0119859, from a residence at the northern edge of the site, at 1,140 ppb TCE and 1.14 ppm TCLP TCE. That sample also contained 73.2 ppb cis-1, 2-DCE and 1.5 ppb PCE. Sample #0119861, from a residence located just south of the previous sample, contained 66.5 ppb TCE and 83.7 ppb cis-1,2-DCE. Samples from two other homes, #'s 0119862, 0119863 and 0119864, contained PCE at concentrations of 3.7 ppb, 2.3 ppb and 2.1 ppb respectively. Two VOCs unrelated to the known plume were also detected in the sump water samples. Sample #0119863 contained 1.0 ppb 1-chlorobutane and Sample #0119860 contained 25.5 ppb chloroform.

#### **3.2 Indoor Air Sampling**

Evacuated 6-liter summa canisters equipped with 8-hour flow controllers were placed in the basements of five homes. Three of these homes had basement sumps that contained water, which was also sampled. The other two homes had no sumps. Sample locations are indicated on Figure 2 in Appendix A.

All air samples were submitted for total organics analysis. Analytical results can be found in Table 2 in Appendix A. Of the five VOCs detected in the sump water, only two were detected in the basement air samples, TCE and cis-1,2-DCE. Sample #0119865, collected from the residence at the northern edge of the site, contained 12 ppb TCE. Sample #0119867, collected from the residence just south of the previous sample, contained 12 ppb TCE and 8.6 ppb cis-1,2-DCE. In addition to the VOCs related to sump water contaminants, seventeen other VOCs were detected in the air samples, as shown in Table 2.

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### **3.3 Sampling Conclusions**

SR sampling documented the presence of three compounds related to the known VOC plume in residential sump water. TCE and cis-1,2-DCE were detected at high concentrations in the basement sump water of two residences at the northern edge of the site. Low concentrations of PCE were also present in one of those residences and in two additional residences. SR sampling also documented the presence of TCE and cis-1,2-DCE in the basement air in the same two residences that have those compounds present in the sump water. Other VOCs were also detected in the air samples but they do not appear to be related to the groundwater contamination.

### **3.4 Missouri Department of Health Review of Sampling Results**

The department's HWP requested that the Missouri Department of Health (DOH) review the sampling data to determine if exposure to the contamination could result in adverse health effects (Reference 7). The Health Consultation report compared the water sample results to EPA's Maximum Contaminant Levels (MCLs) for drinking water. MCLs are regulatory standards for public drinking water and can be used as a screening tool when considering analytical results for water samples. The levels of TCE and cis-1,2-DCE found in samples from two of the homes exceed MCLs for these compounds (5 ppb and 70 ppb, respectively); however, the report states that since the water was from basement sumps, it is unreasonable to assume anyone would be drinking it (Reference 7, p. 2).

The Health Consultation report compared the air sample results to Environmental Media Evaluation Guides (EMEGs) for Chronic Exposure in Air. EMEGs were developed by the Agency for Toxic Substances and Disease Registry (ATSDR) and are evaluation guides that are specific to an environmental medium (air, water, soil), below which adverse health effects are unlikely. The TCE levels found in the air samples were determined to be below the EMEG for TCE in air and are therefore unlikely to cause adverse health effects. Since the ATSDR has not developed an EMEG for DCE in air, a Reference dose was used as a screening tool for that compound. A Reference dose is the daily dose of a chemical found in a specific medium (e.g., air, water, soil) below which levels are unlikely to cause adverse health effects. The calculated dose for DCE in the basement air was several orders of magnitude below the Reference dose; therefore, adverse health effects are not likely to occur from exposures to the DCE-contaminated basement air. None of the other VOCs detected in basement air samples were found to be above an EMEG or a Reference dose, and therefore are not at levels of health concern. Many of these other compounds detected in the basement air are constituents of common household and yard items such as gasoline, paints and paint thinners and other solvents (Reference 7, p. 2).

The report classified the Chicago Heights Blvd VOC Plume site as a No Apparent Public Health Hazard. This conclusion was based on the following: contaminants found in the sump water and basement air were not at levels expected to cause adverse health effects; finding and eliminating the sources of the non-site-related contaminants in the air may reduce exposures; and further

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sampling may be necessary to determine if samples collected during the SR are representative of year-round conditions.

### 4.0 SUMMARY

The Chicago Heights Boulevard VOC Plume site is a groundwater plume of VOCs located beneath a residential neighborhood in an unincorporated segment of St. Louis County, near Overland, Missouri. The neighborhood is approximately 15 acres in size and consists of approximately 35 individual homes and 12 apartment buildings that lie within a heavily urbanized area, surrounded by various industrial and commercial businesses. Many of the residential foundations in the neighborhood are often in contact with perched water and have a basement sump, into which outside water is drained and pumped away. Chlorinated solvents were first discovered in the groundwater beneath the neighborhood in the summer of 1998, during an environmental investigation that was conducted for a nearby hazardous waste site. After additional sampling in 1999 failed to establish a clear migration route, the neighborhood was referred to the department's SEU for further evaluation. Although the groundwater in the area is not used as a drinking water source, there was concern that downgradient residences with basements could be subject to vapors from the groundwater that enters the basement sumps or from vapor migration through walls.

Two hazardous waste sites are known to exist in the immediate vicinity of the Chicago Heights Boulevard VOC Plume site: the All American Life Insurance Company located south of the site, and PerkinElmer (formerly EG&G/Missouri Metals Shaping Company) located north and northwest of the site. The All American Life Insurance Company was the location of small scale dumping during the mid-1960's. Remedial investigations and actions within the department's VCP took place between October 1996 and June 1999. Petroleum compounds and lead were found in the soil and groundwater. VOCs were also found in the groundwater; however, it was determined that the PCE, TCE, and cis-1,2-DCE were originating off-site from an upgradient source.

The PerkinElmer site is a metals fabrication facility that has been manufacturing aircraft component parts since 1957. VOCs were first documented in the soil and groundwater at the facility in 1988. In September 1991, the department proposed the site for the *Registry of Confirmed Abandoned or Uncontrolled hazardous Waste Disposal Sites in Missouri*. EG&G appealed and negotiated a *Registry* consent agreement that was finalized in 1994. Various remedial investigations and activities have taken place since 1991; however, it was not until 1998 that chlorinated solvents were first documented in soil and groundwater downgradient of the EG&G facility, in the northern edge of the residential area. Two different contractors for EG&G conducted several off-site investigations in the residential area during 1998 and 1999. During those investigations, VOCs were documented in the groundwater south of the EG&G site. A low level of TCE was detected in a water sample from the basement sump of one residence; however, no VOCs were found in air samples from four residential basements and the

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VOC plume was not defined. The groundwater gradient was determined to be to the southeast from the EG&G facility and across the residential area. One report concluded that VOC contaminants in the southern portion of the residential area did not migrate from the EG&G site, but probably came from a separate source.

In 1999 and 2000, HWP/SEU conducted a Combined PA/SI for the Chicago Heights Boulevard VOC Plume site to determine the location and the probable source of the VOC plume and the threat to human health and the environment. Temporary monitoring wells were installed throughout the site. PA/SI sampling documented VOCs as high as 1,140 ppb TCE and 716 ppb PCE in wells at the northern edge of the site and much lower concentrations in wells farther south. A hydrogeologic review of the sampling data concluded that groundwater contamination from the EG&G (now PerkinElmer) site was migrating in a relatively tight pattern off-site into the northern residential area, and that a significant preferential subsurface pathway exists. The PA/SI found minimal threat to human health and the environment from the groundwater and surface water pathways. Also, the risk from exposure to soil and to airborne soil particles at the site was negligible. However, there was a potential threat to residents from vapors from contaminated water entering basement sumps and vapor migration through basement walls. Indoor air sampling was recommended for homes in the path of the plume where VOC concentrations were at levels of concern.

An SR to conduct the additional sampling was initiated on February 21, 2001. SR sampling documented three compounds related to the known VOC plume in basement sump water samples and two of those compounds in basement air samples. TCE and cis-1,2-DCE were detected at high concentrations in the basement sump water of two residences at the northern edge of the site. Highest concentrations were 1,140 ppb TCE (1.14 ppm TCLP TCE) and 83.7 ppb cis-1,2-DCE. Low concentrations of PCE were also present in one of those residences and in two additional residences. SR sampling also documented the presence of TCE and cis-1,2-DCE in the basement air in the same two residences that have those compounds present in the sump water. Concentrations were 12 ppb TCE and 8.6 ppb cis-1,2-DCE. Other VOCs also detected in the basement air samples do not appear to be related to the groundwater contamination.

The DOH prepared a Health Consultation report based on the sampling data. That report concluded that the contaminants detected in the sump water and/or basement air that are believed to be attributable to the Chicago Heights Boulevard VOC Plume site are not at levels expected to cause adverse health effects. Although the levels of TCE and cis-1,2-DCE found in the sump water exceed their MCLs, it is unreasonable to assume anyone would be drinking sump water. The non-site-related VOC contaminants that were also detected in basement air are constituents of common household and yard items such as gasoline, paints and paint thinners and other solvents. They are also not at levels that are expected to cause adverse health effects.

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**5.0 CONCLUSIONS AND RECOMMENDATIONS**

VOCs related to groundwater contamination are present in the sump water and in the indoor air in the basements of residences at the Chicago Heights Blvd VOC Plume site. The DOH has determined that the current levels of VOCs found in the air samples are not expected to cause adverse health effects. Based on current site conditions and available information, further CERCLA actions are not recommended at this time. However, the responsible party for the adjacent PerkinElmer site should make efforts to halt the continuing migration of VOCs from that site into the residential area. The PerkinElmer site is currently conducting remedial design for cleanup action pursuant to a *Registry* Consent Agreement with the department. During PerkinElmer's remedial activities, sump water and indoor air should be sampled in the residence at the intersection of Meeks Boulevard and Elmridge Place, where access was not gained during the SR. Since site conditions can change and concentrations may increase, continued monitoring of the indoor air is recommended at that residence and at the first two residences on the west side of Wishart Place, at the intersection of Meeks Boulevard and Wishart Place.

Prepared by: Nancy H. Priddy 12-19-01  
Nancy H. Priddy Date  
Environmental Specialist  
Site Evaluation Unit

Reviewed by: Julieann Warren 12-19-01  
Julieann Warren Date  
Chief  
Site Evaluation Unit

Approved by: Gary T. Behrns 12/19/01  
Gary T. Behrns Date  
Chief  
Superfund Section

**Chicago Heights Blvd VOC Plume  
Site Reassessment**

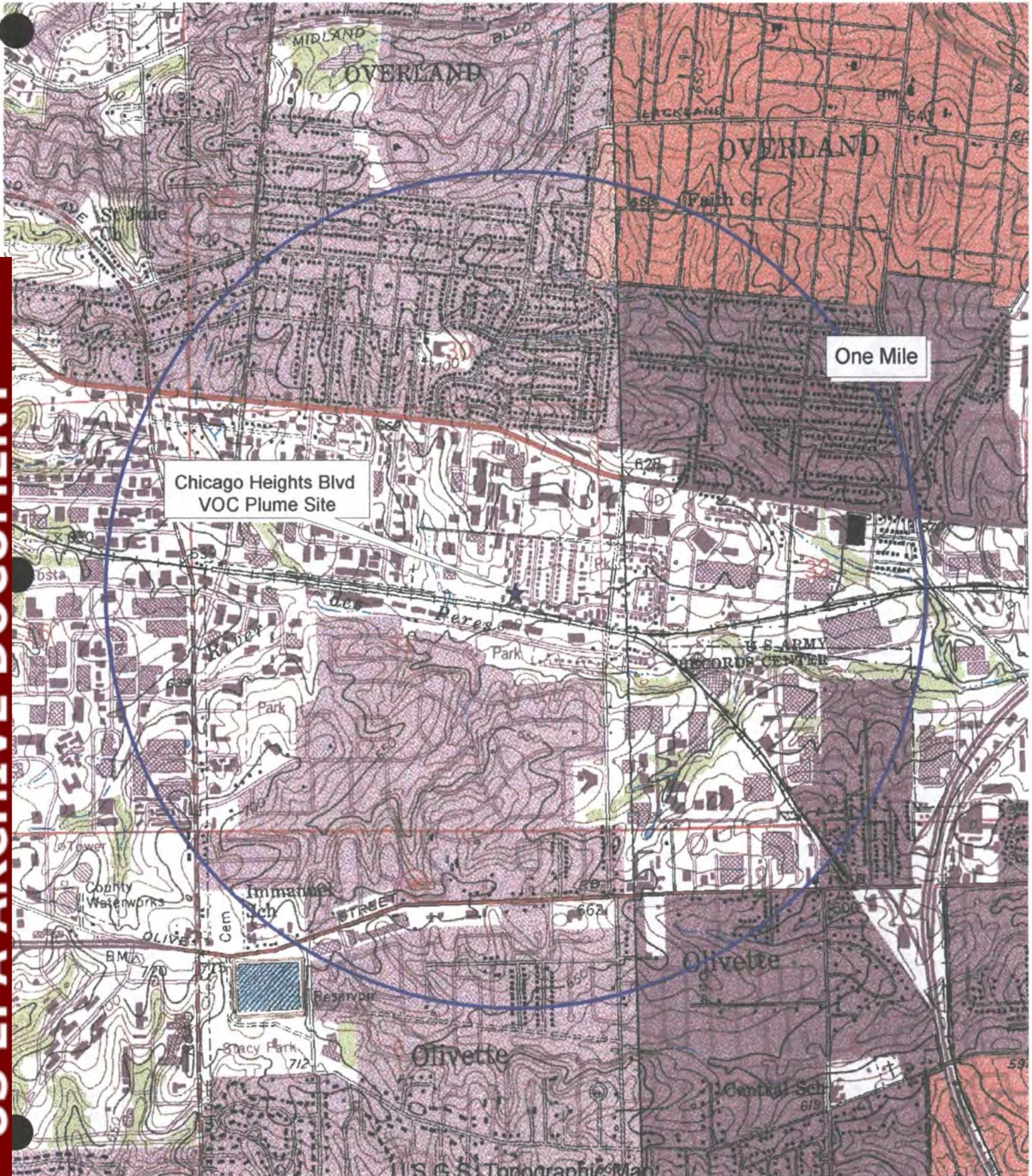
**REFERENCES**

1. U.S. Environmental Protection Agency Hazard Ranking System, 40 CFR Part 260-299; Part 300-399, July 1, 1994.
2. U.S. Environmental Protection Agency, September 1995 Superfund Chemical Data Matrix (SCDM).
3. U.S. Geological Survey. Creve Coeur, Clayton, MO quadrangles, 7.5 minute series. Topographic Maps.
4. Priddy, Nancy, HWP, DEQ, DNR. Combined Preliminary Assessment/Site Inspection Report, Chicago Heights Blvd VOC Plume, Overland, Missouri. March 28, 2000. 24 pages plus appendices.
5. Zychinski, Tom, Project Manager, Burns & McDonnell Waste Consultants, Inc., Fenton Missouri. Letter to R. Lance Livesay, HWP, DEQ, DNR regarding Phase II-Off-Site Monitoring Well Installation, PerkinElmer, Missouri Metals Site, Overland, Missouri. April 13, 2001. 4 pages plus tables and attachments.
6. Allen, Brian J., Environmental Specialist, ESP, DEQ, DNR. Site Reassessment Investigation, Chicago Heights Boulevard VOC Plume Site, Overland, Mo. May 22, 2001. 3 pages plus attachments.
7. U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry, Division of Health Assessment and Consultation, Atlanta, Georgia. Health Consultation, Review of Basement Sampling Data, Chicago Heights Boulevard VOC Plume Site, Overland, St. Louis County, Missouri, August 8, 2001. Prepared by Missouri Department of Health, Section for Environmental Public Health. 7 pages.
8. Priddy, Nancy, HWP, DEQ, DNR. Telephone record to Chicago Heights Blvd VOC Plume Superfund Technical File regarding Sump Pump Operation in Residences. December 12, 2001. 1 page.

## APPENDIX A

- Figure 1. Site Location Map
- Figure 2. Site Sketch / SR Sample Location Map
- Figure 3. SR VOC Concentrations Map
- Table 1. SR Sump Water Sample Results
- Table 2. SR Indoor Air Sample Results

Figure 1  
Site Location Map  
Chicago Heights Blvd VOC Plume  
St. Louis County, Missouri



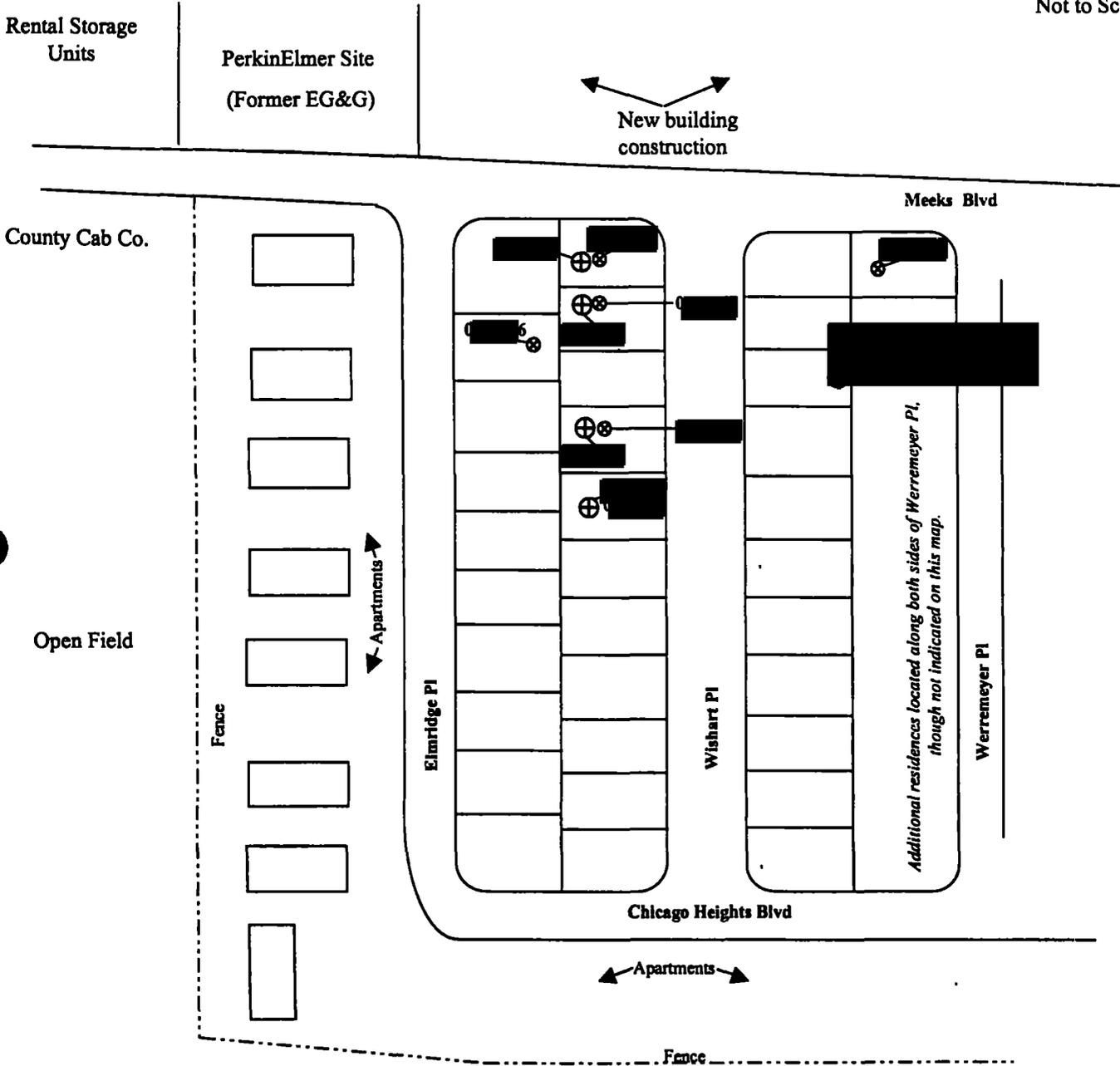
US EPA ARCHIVE DOCUMENT

U.S. G.S. Topographic Map  
7.5 Minute Series

Creve Coeur and Clayton, Missouri Quadrangles, 1993

**Figure 2**  
**Site Sketch / Sample Location Map**  
**Chicago Heights Blvd VOC Plume SR**  
**St. Louis County, Missouri**  
**April 24, 2001**

↑  
**N**  
 Not to Scale



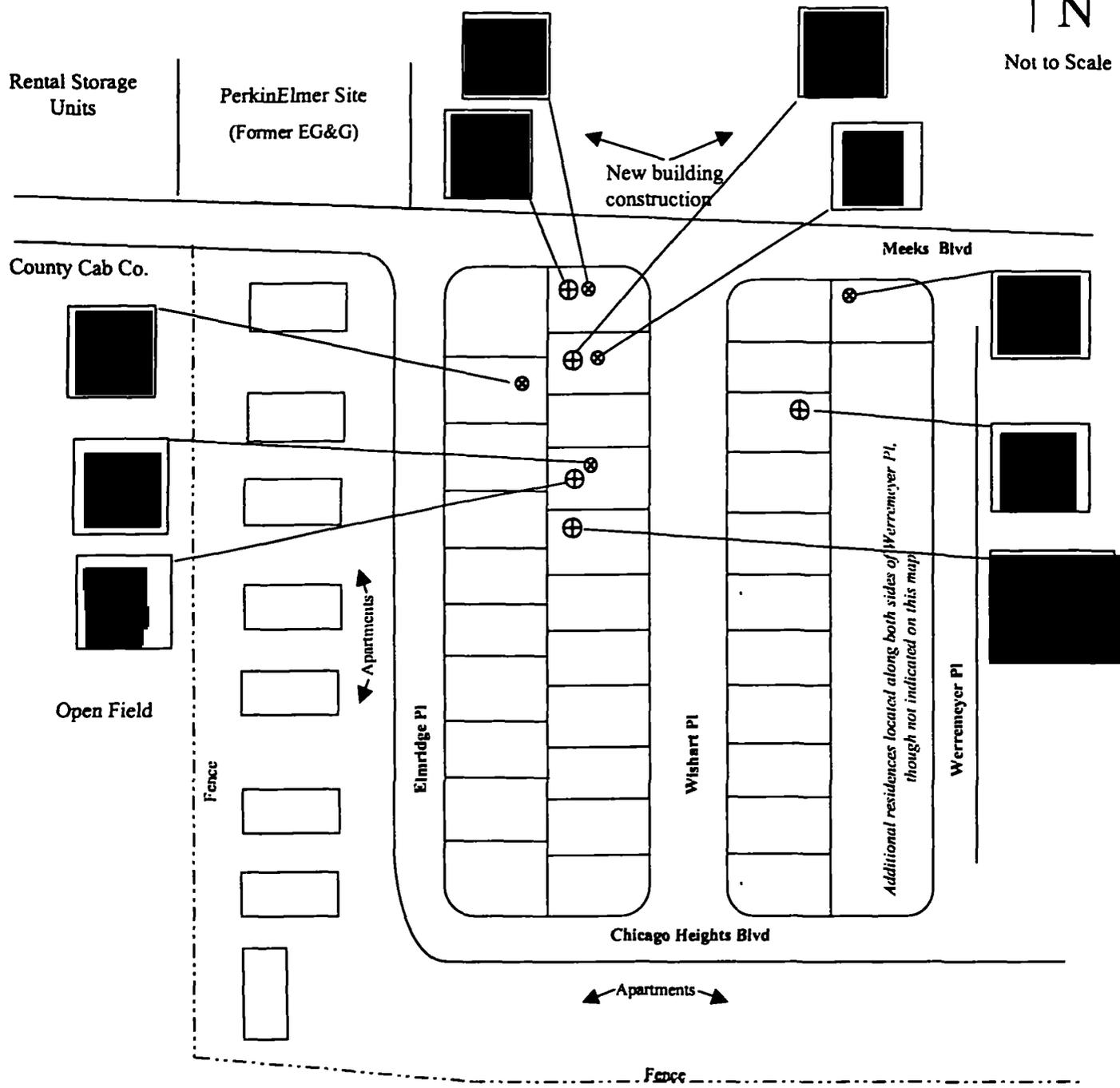
All American Life  
 Insurance Site

<b>LEGEND</b>	
⊕	Water sample collected at location indicated
⊙	Air sample collected at location indicated
011XXXX	Sample collected at location indicated

Dielman Rock Island Dr.

**Figure 3**  
**VOC Concentrations**  
**Chicago Heights Blvd VOC Plume SR**  
**St. Louis County, Missouri**  
**April 24, 2001**

↑  
**N**  
 Not to Scale



<b>LEGEND</b>	
⊕	Water sample collected at location indicated
⊙	Air sample collected at location indicated
011XXXX	Sample collected at location indicated
TCE 66.5	Concentration in ppb
ND	Non - Detect

All American Life  
 Insurance Site

Dielman Rock Island Dr

**Table 1. Selected Analytical Results for Sump Water Samples  
Chicago Heights Boulevard VOC Plume SR  
April 24, 2001**

Analyte							MCL
* Cis-1,2-Dichloroethene	<b>73.2</b>	<1.0	<b>83.7</b>	<1.0	<1.0	<1.0	70
Chloroform	<1.0	25.5	<1.0	<1.0	<1.0	<1.0	80
* Trichloroethene	<b>1,140</b>	<1.0	<b>66.5</b>	<1.0	<1.0	<1.0	5
* Trichloroethene (TCLP)	1.14 ppm	NA	NA	NA	NA	NA	NA
* Tetrachloroethene	1.5	<1.0	<1.0	3.7	2.3	2.1	5
1-Chlorobutane	<1.0	<1.0	<1.0	<1.0	1.0	<1.0	2,400

- All values are in parts per billion (ppb or ug/L) unless otherwise indicated.

- \* denotes analytes related to the known VOC plume.

- MCL = Maximum Contaminant Level; the MCL for drinking water is used as a basis for comparison, even though groundwater is not used for a drinking water supply at this site.

- NA = Not Analyzed, or when referring to benchmarks, Not Available.

- Bold values are those which exceed the MCL.

**Table 2. Selected Analytical Results for In-door Air Samples  
Chicago Heights Boulevard VOC Plume SR  
April 24, 2001**

Analyte						EMEG ppb
	ppb (v/v)					
Trichlorofluoromethane	<1.5	<1.2	1.7	1.3	<1.2	NA
Acetone	8.1	<4.6	20	110	17	13,000
Methylene Chloride	<1.5	11	<1.2	<1.1	1.4	300
Hexane	<6.0	9.4	<4.6	9.2	<4.6	600
* Cis-1,2-Dichloroethene	<1.5	<1.2	8.6	<1.1	<1.2	NA
Benzene	2.4	2.6	<1.2	2.1	<1.2	50
Heptane	<6.0	<4.6	<4.6	5.0	<4.6	NA
* Trichloroethene	12	<1.2	12	<1.1	<1.2	100
Toluene	9.5	15	4.1	5.0	3.2	80
* Tetrachloroethene	<1.5	<1.2	<1.2	<1.1	<1.2	NA
Ethylbenzene	<1.5	2.3	<1.2	<1.1	<1.2	1,000
Total Xylenes (m, p, and o)	5.3	12.4	1.6	1.4	<1.2	100
1,2,4-Trimethylbenzene	<1.5	2.9	<1.2	<1.1	<1.2	NA
1,4-Dichlorobenzene	<1.5	<1.2	9.0	<1.1	<1.2	100
Isopropyl Alcohol	<6.0	89	35	380	<4.6	NA
Methyl Tertiary Butyl Ether	17	30	<4.6	<4.5	<4.6	700
Ethyl Acetate	<6.0	<4.6	16	5.5	<4.6	NA
Cyclohexane	<6.0	<4.6	<4.6	4.8	<4.6	NA
Ethanol	33	33	180	200	17	NA
4-Ethyltoluene	<6.0	2.7	<4.6	<4.5	<4.6	NA

- All values are in parts per billion (ppb) unless otherwise indicated.

- \* denotes analytes related to the known VOC plume.

- EMEG = Environmental Media Evaluation Guide for Chronic Exposure in Air

- NA = Not Analyzed, or when referring to benchmarks, Not Available.

- Bold values are those which exceed the applicable benchmark.

## APPENDIX B

### PerkinElmer Site – Additional Off-Site Investigation, 1999

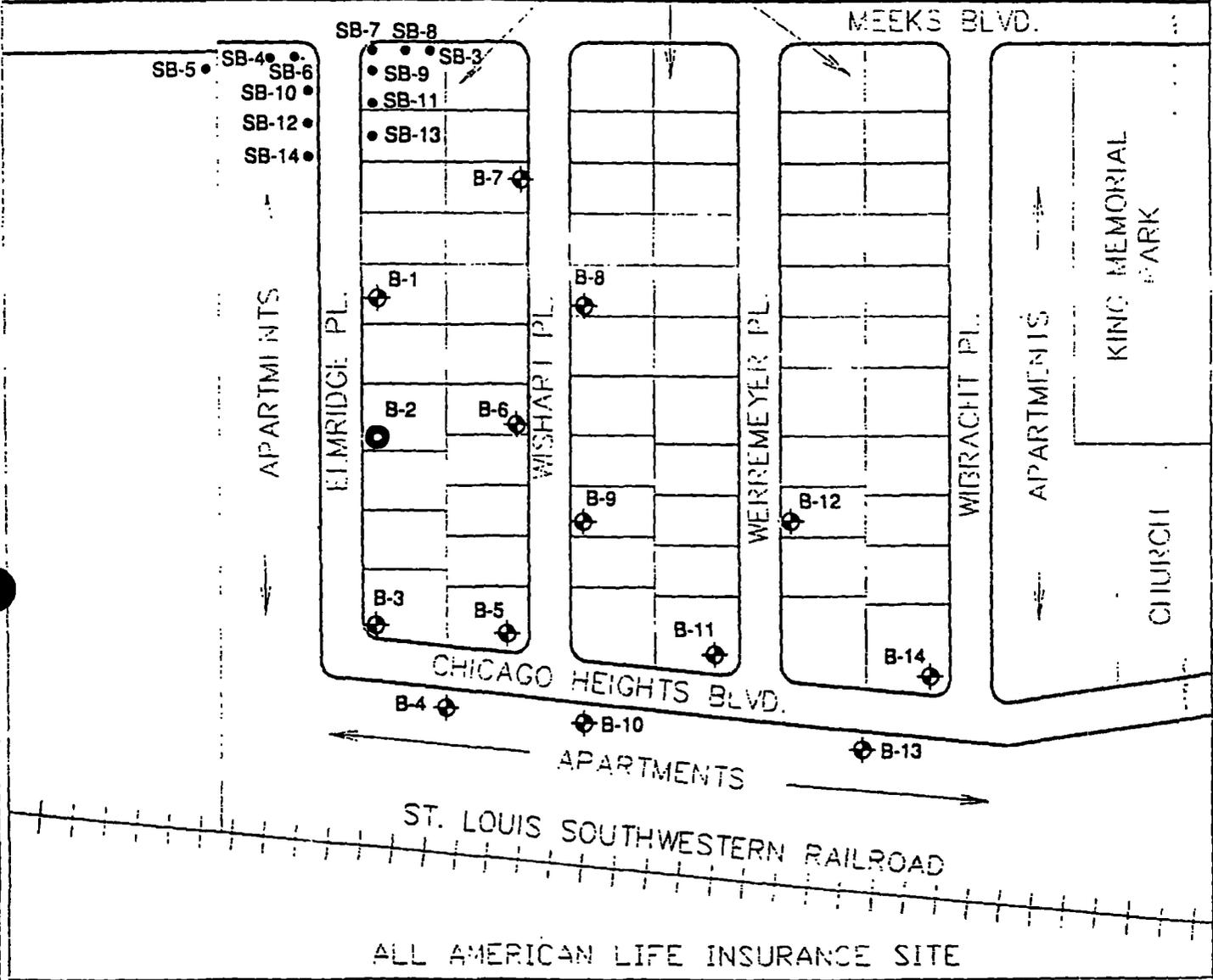
- Figure 1. Piezometer Locations
- Figure 2. Refusal Depth Contour Map
- Figure 3. Groundwater Contour Map
- Figure 4. TCE in Groundwater - August 1999
- Figure 5. PCE in Groundwater - August 1999
- Table 1. Summary of Depth to Refusal Data
- Table 2. Summary of Water Level Data

EG&G  
S.TE  
SB-1 ● SB-2 ●

OPEN FIELD

SINGLE FAMILY  
RESIDENTIAL DWELLINGS

EQUIPMENT  
RENTAL  
COMPANY



**LEGEND**

- B-1 FINAL PIEZOMETER LOCATION
- B-2 FINAL BORING LOCATION (No Piezometer Installed)
- SB-2 PREVIOUS BORING LOCATION (August 1998)



**Burns  
&  
McDonnell  
Waste  
Consultants,  
Inc**

Figure 1  
ADDITIONAL OFF-SITE  
INVESTIGATION  
EG&G MISSOURI METALS SITE  
OVERLAND, MISSOURI

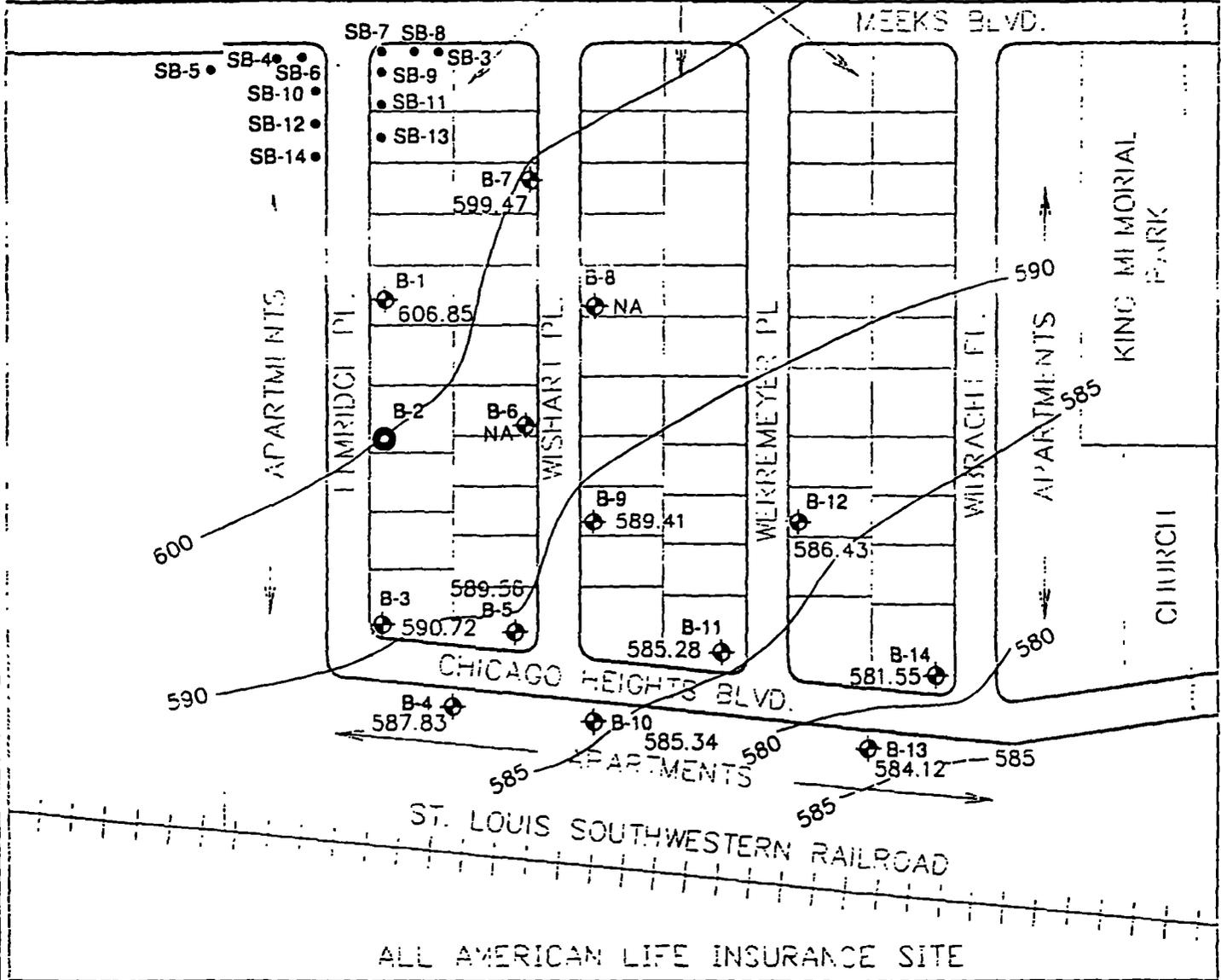
TITAN:91319M0060 EG&G.DWG

EG&G  
SITE  
SB-2  
SB-1

OPEN FIELD

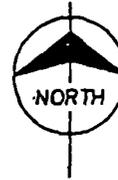
EQUIPMENT  
RENTAL  
COMPANY

SINGLE FAMILY  
RESIDENTIAL DWELLING 600



**LEGEND**

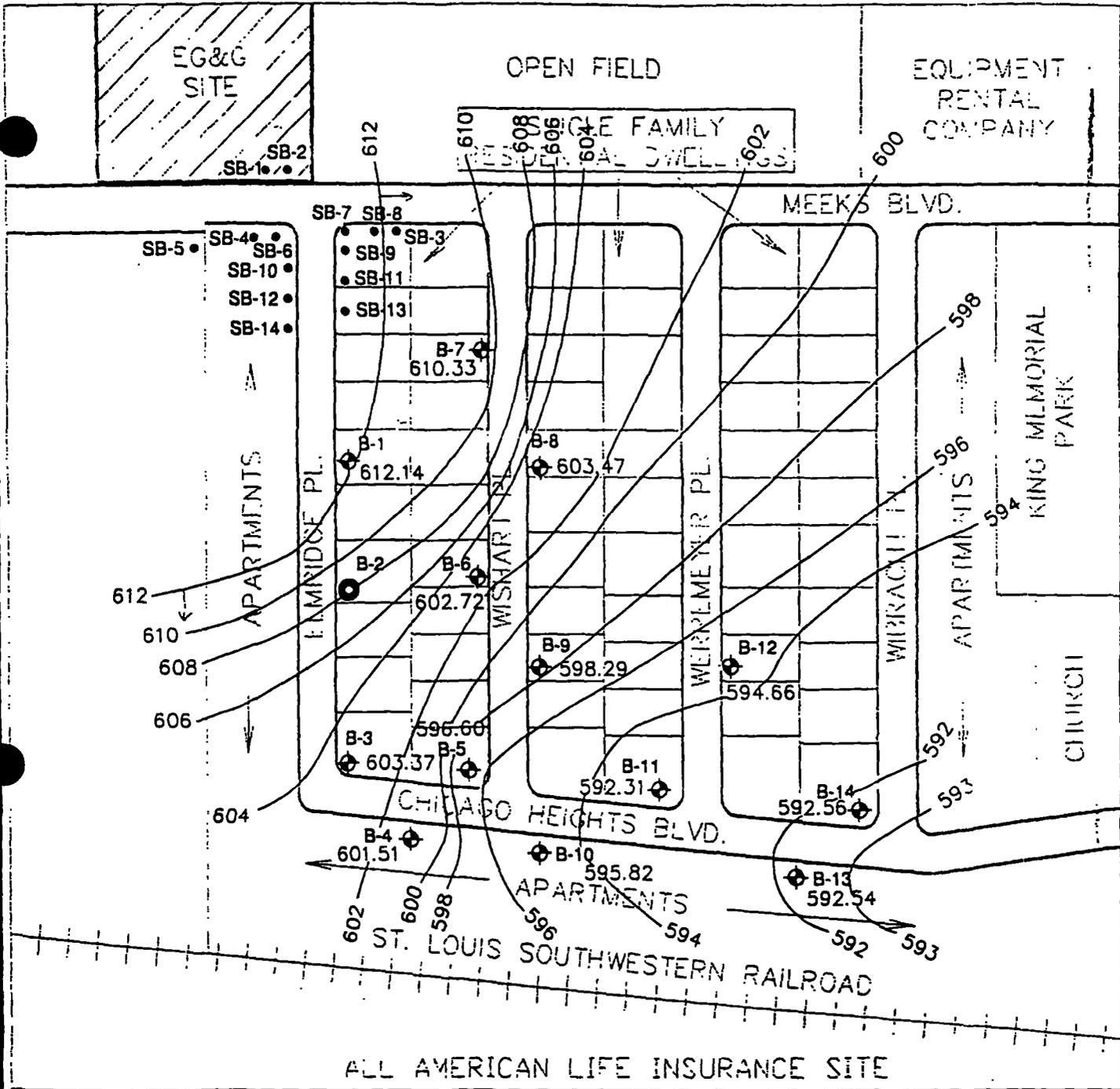
- B-1  FINAL PIEZOMETER LOCATION
- 606.85  REFUSAL DEPTH ELEVATION (Feet Above Sea Level)
- B-2  FINAL BORING LOCATION (No Piezometer Installed)
- SB-2  PREVIOUS BORING LOCATION (August 1998)
-  REFUSAL DEPTH CONTOUR



**Burns  
&  
McDonnell  
Waste  
Consultants  
Inc**

Figure 2  
REFUSAL DEPTH  
CONTOUR MAP  
AUGUST 1999  
EG&G MISSOURI METALS SITE  
OVERLAND, MISSOURI

TTIAN19131914008\CADD\EG&G.DWG



**LEGEND**

- B-1 FINAL PIEZOMETER LOCATION
- 612.14 PIEZOMETRIC SURFACE ELEVATION (Feet Above Sea Level)
- B-2 FINAL BORING LOCATION (No Piezometer Installed)
- SB-2 PREVIOUS BORING LOCATION (August 1998)
- 612 PIEZOMETRIC SURFACE CONTOUR



**Burns  
&  
McDonnell  
Waste  
Consultants,  
Inc**

Figure 3  
GROUNDWATER  
CONTOUR MAP  
AUGUST 1999  
EG&G MISSOURI METALS SITE  
OVERLAND, MISSOURI

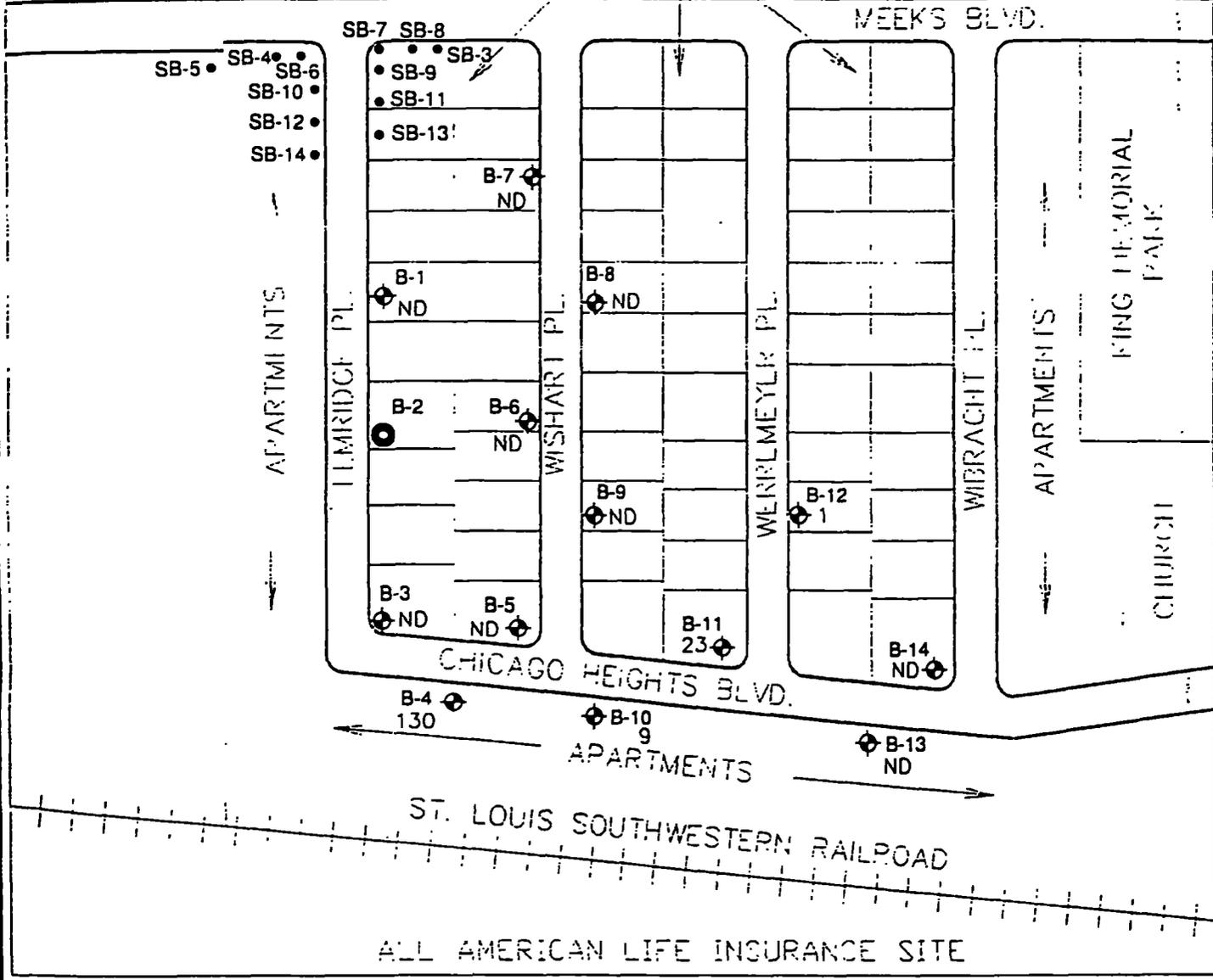
TITAN:1913191 ADD:EG&G.DWG

EG&G  
SITE  
SB-1 ● SB-2 ●

OPEN FIELD

EQUIPMENT  
RENTAL  
COMPANY

SINGLE FAMILY  
RESIDENTIAL DWELLINGS



**LEGEND**

- B-1 FINAL PIEZOMETER LOCATION
- 130 TCE IN GROUNDWATER CONCENTRATION (ug/L)
- B-2 FINAL BORING LOCATION (No Piezometer Installed)
- SB-2 PREVIOUS BORING LOCATION (August 1998)
- ND NOT DETECTED (Reporting Limit = 1 ug/L)



**Burns  
&  
McDonnell  
Waste  
Consultants  
Inc.**

Figure 4  
TCE IN  
GROUNDWATER  
AUGUST 1999  
EG&G MISSOURI METALS SITE  
OVERLAND, MISSOURI

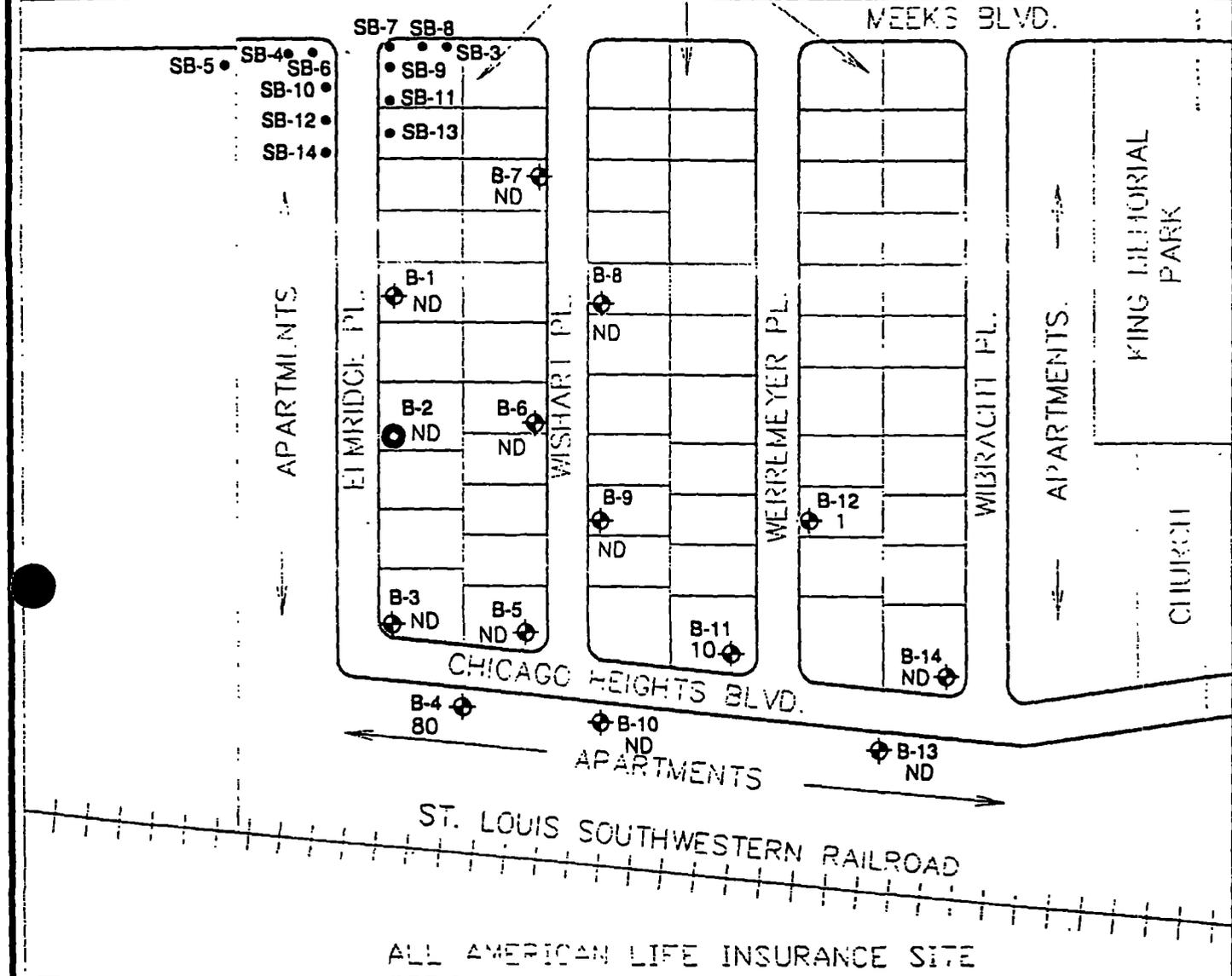
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EG&G  
SITE

OPEN FIELD

SINGLE FAMILY  
RESIDENTIAL DWELLINGS

EQUIPMENT  
RENTAL  
COMPANY



**LEGEND**

- B-1  FINAL PIEZOMETER LOCATION
- 80  PCE IN GROUNDWATER CONCENTRATION (ug/L)
- B-2  FINAL BORING LOCATION (No Piezometer Installed)
- SB-2  PREVIOUS BORING LOCATION (August 1998)
- ND  NOT DETECTED (Reporting Limit = 1 ug/L)



**Burns  
&  
McDonnell  
Waste  
Consultants,  
Inc**

Figure 5  
PCE IN  
GROUNDWATER  
AUGUST 1999  
EG&G MISSOURI METALS SITE  
OVERLAND, MISSOURI

TITAN:91310/40061 EG&G.DWG

**Table 1**  
**Summary of Depth to Refusal Data**  
**EG&G Missouri Metals Additional Off-Site Investigation**  
**August 1999**

Temporary Piezometer	Date	(A)	Depth to Top of Screen (feet)	(B)	(A)-(B)	Refusal Depth Elevation* (feet)
		Casing Rim Elevation (feet)		Total Depth (feet)	Casing Base Elevation (feet)	
B-1	8/13/99	624.88	2.5	18.25	606.63	606.85
B-3	8/13/99	611.37	2.1	20.87	590.50	590.72
B-4	8/13/99	608.83	1.5	21.22	587.61	587.83
B-5	8/13/99	607.59	4.5	18.25	589.34	589.56
B-6	8/13/99	610.22	2.0	NA	NA	NA
B-7	8/13/99	620.43	1.0	21.18	599.25	599.47
B-8	8/13/99	615.47	2.0	NA	NA	NA
B-9	8/13/99	607.34	2.0	18.15	589.19	589.41
B-10	8/13/99	606.37	3.5	21.25	585.12	585.34
B-11	8/13/99	603.31	2.0	18.25	585.06	585.28
B-12	8/13/99	605.78	1.5	19.57	586.21	586.43
B-13	8/13/99	602.15	3.0	18.25	583.9	584.12
B-14	8/13/99	602.58	1.0	21.25	581.33	581.55

**Notes**

NA - Not Applicable - Refusal was not encountered during boring installation

\* - Refusal surface elevation = Casing base elevation + 0.22 feet.

Stainless steel drive points attached to base of casing are 0.22 feet in vertical length.

**Table 2**  
**Summary of Water Level Data**  
**EG&G Missouri Metals Additional Off-Site Investigation**  
**August 1999**

Temporary Piezometer	Date	(A)	Depth to Top of Screen (feet)	(B)	(A)-(B)	Piezometric Surface Elevation (feet)
		Casing Rim Elevation (feet)		Depth to Water (feet)	Water Surface Elevation (feet)	
B-1	8/13/99	624.88	2.5	12.74	612.14	612.14
B-3	8/13/99	611.37	2.1	8.00	603.37	603.37
B-4	8/13/99	608.83	1.5	7.32	601.51	601.51
B-5	8/13/99	607.59	4.5	10.99	596.60	596.60
B-6	8/13/99	610.22	2.0	7.50	602.72	602.72
B-7	8/13/99	620.43	1.0	10.10	610.33	610.33
B-8	8/13/99	615.47	2.0	12.00	603.47	603.47
B-9	8/13/99	607.34	2.0	9.05	598.29	598.29
B-10	8/13/99	606.37	3.5	10.55	595.82	595.82
B-11	8/13/99	603.31	2.0	11.00	592.31	592.31
B-12	8/13/99	605.78	1.5	11.12	594.66	594.66
B-13	8/13/99	602.15	3.0	9.61	592.54	592.54
B-14	8/13/99	602.58	1.0	10.02	592.56	592.56

## APPENDIX C

Combined PA/SI Investigation, December 1999

Figure 1. PA/SI Sample Location / Sampling Results Map

Table 1. Temporary Well Information

Table 2. Sample Listing / Descriptions

Table 3. Analytical Results for Groundwater Samples

Figure 1  
 PA/SI Sampling Results  
 Chicago Heights Blvd VOC Plume Site  
 St. Louis County, Missouri

December 1999

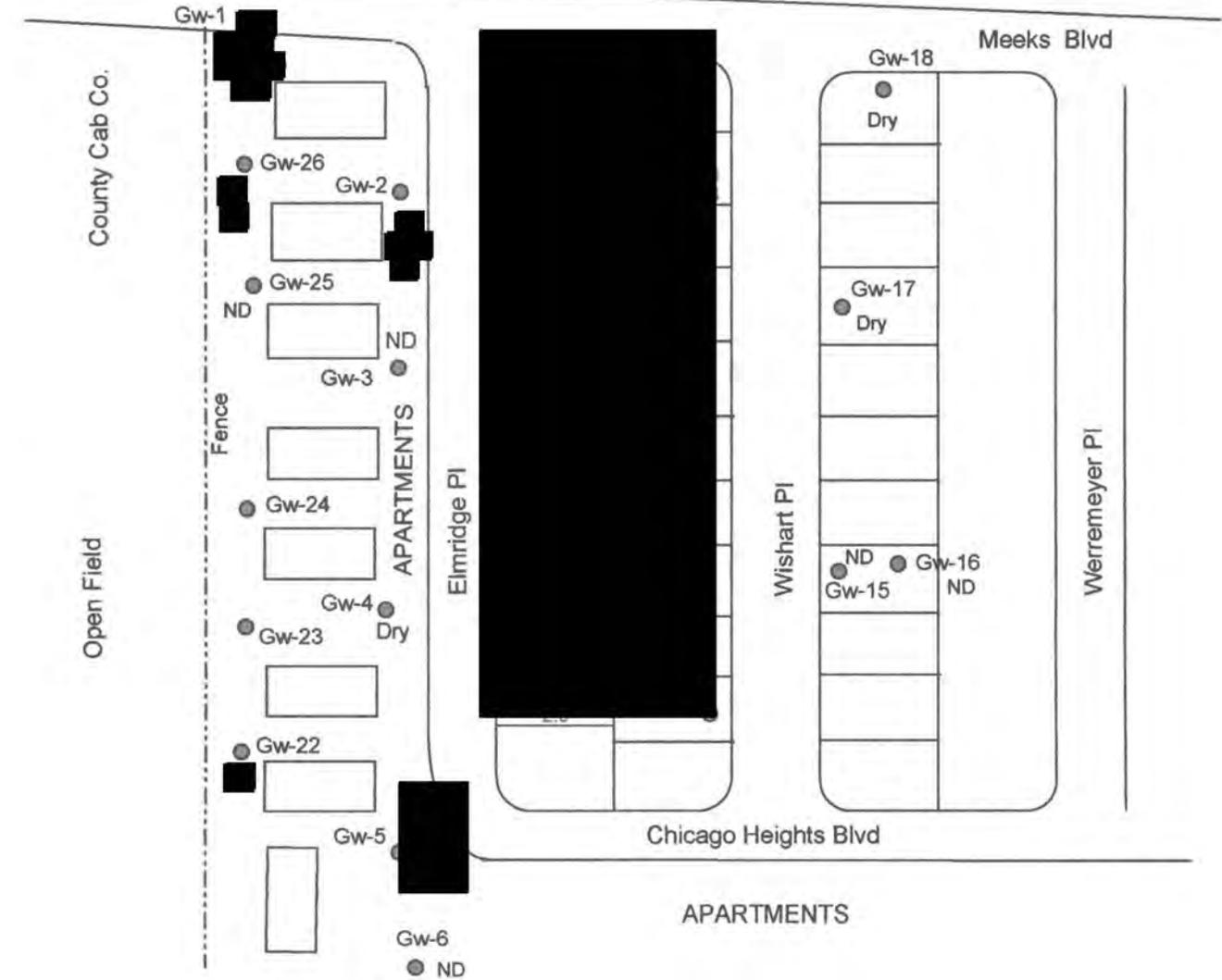


Not to Scale

Rental Storage Units

PerkinElmer  
 Missouri Metals  
 (E G & G)  
 Site

Open Field



LEGEND

- GW-1 Groundwater well
- location
- 376 Concentration in ug/L
- ND Not Detected

- PCE
- TCE
- DCE - includes cis-1,2-, trans-1,2-, and 1,1-DCE
- Vinyl Chloride
- TCA

All American Life  
 Insurance Site

Table 1  
 Temporary Well Information  
 Chicago Heights Blvd Voc Plume PA/SI  
 St. Louis County, Missouri  
 December 1999

Well Identity	Total Depth – ft (below ground surface)	Depth to Water – ft (below ground surface)	Water Column – ft
GW-01	27.5	25.0	2.5
GW-02	29.2	25.2	4.0
GW-03	25.0	16.2	8.8
GW-04	27.0	Dry	-
GW-05	26.0	16.0	10.0
GW-06	24.0	22.5	1.5
GW-07	25.0	15.0	10.0
GW-08	23.1	10.2	12.9
GW-09	19.5	9.81	9.69
GW-10	18.1	7.4	10.7
GW-11	23.1	8.25	14.85
GW-12	17.0	7.8	9.2
GW-13	20.8	8.0	12.8
GW-14	20.3	9.3	11.0
GW-15	22.2	15.15	7.05
GW-16	20.3	13.0	7.3
GW-17	19.0	Dry	-
GW-18	18.2	Dry	-
GW-19	24.4	8.2	16.2
GW-20	22.0	Dry	-
GW-21	20.7	13.0	6.3
GW-22	17.6	7.7	9.9
GW-23	20.6	16.0	4.6
GW-24	22.7	16.3	6.4
GW-25	17.1	13.4	3.7
GW-26	23.0	20.4	2.6

Table 2  
 Sample Listing / Descriptions  
 Chicago Heights Blvd VOC Plume PA/SI  
 St. Louis County, Missouri  
 December 1999

Sample #	Sample Media/Type	Location Collected/Description	Date/Time Collected
990049	QA/QC sample (trip blank)	Analyte-free water prepared at ESP laboratory.	11/28/99
997541	Water grab	Temporary well GW-02 located 6 ft west of the west edge of Elmridge Place and 9 ft south of the south edge of the first (northernmost) parking lot entrance. Sample was heavily turbid and medium brown.	11/29/99 @ 1355
997542	Water grab	Temporary well GW-01, located 125 ft west of the west edge of Elmridge Place and 12 ft south of the south edge of Meeks Blvd. Sample was moderately turbid and colorless.	11/30/99 @ 0740
997543	Water grab	Temporary well GW-07, located 30 ft south of the south edge of Meeks Blvd and 57 ft east of the east edge of Elmridge Place. Sample was heavily turbid and medium brown.	11/30/99 @ 0755
997544	QA/QC sample (duplicate)	Duplicate sample of 997543, entered onto chain-of-custody as "Blind duplicate". Same description as above.	11/30/99 @ 0755
997545	Water grab	Temporary well GW-05, located 12 ft west of the west edge of Elmridge Place and 10 ft south of the south edge of Chicago Heights Blvd. Sample was moderately turbid and light brown.	11/30/99 @ 0815
997546	Water grab	Temporary well GW-26, located 100 ft west of the west edge of Elmridge Place and 50 ft north of the north edge of the building representing [REDACTED]. Sample was clear and colorless.	12/1/99 @ 0826
997547	Water grab	Temporary well GW-19, located at the east edge of Elmridge Place, 10 ft south of the south edge of the driveway at [REDACTED]. Sample was slightly turbid and light brown.	12/1/99 @ 0845
997548	Water grab	Temporary well GW-03, located 6 ft west of the west edge of Elmridge Place and 6 ft north of the north edge of the second parking lot entrance. Sample was slightly turbid and light brown.	12/1/99 @ 0855
997549	Water grab	Temporary well GW-24, located 105 ft west of the west edge of Elmridge Place and 22 ft north of the building representing [REDACTED]. Sample was slightly turbid and light brown.	12/1/99 @ 0910
997550	QA/QC sample (duplicate)	Duplicate sample of 997549, entered onto chain-of-custody as "Blind duplicate". Same description as above.	12/1/99 @ 0910
997551	Water grab	Temporary well GW-21, located 22 ft west and 12 ft south of the southwest corner of the house at [REDACTED]. Sample was clear and colorless.	12/1/99 @ 0920
997552	Water grab	Temporary well GW-06, located 125 ft south of the south edge of Chicago Heights Blvd and 27 ft west of the west edge of Elmridge Place. Sample was clear and colorless.	12/1/99 @ 0925
997553	Water grab	Temporary well GW-14, located 12 ft south and 20 ft east of the northeast corner of the carport at [REDACTED] Place (immediately south of the driveway). Sample was slightly turbid and light brown.	12/1/99 @ 0940
997554	Water grab	Temporary well GW-09, located 12 ft west and 7 ft north of the northwest corner of the house at [REDACTED] Place. Sample was slightly turbid and light brown.	12/1/99 @ 0950

Table 2 (continued)  
 Sample Listing / Descriptions  
 Chicago Heights Blvd VOC Plume PA/SI  
 St. Louis County, Missouri  
 December 1999

Sample #	Sample Media/Type	Location Collected/Description	Date/Time Collected
997571	QA/QC sample (trip blank)	Analyte-free water prepared at ESP laboratory.	12/7/99
997572	Water grab	Temporary well GW-15, located 20 ft west of the northwest corner of the house at [REDACTED]. Sample was clear and colorless.	12/7/99 @ 0950
997573	Water grab	Temporary well GW-16, located 25 ft east of the northeast corner of the house at [REDACTED]. Sample was clear and colorless.	12/7/99 @ 1000
997574	Water grab	Temporary well GW-13, located 20 ft west and 14 ft south of the southwest corner of the house at [REDACTED] Place. Sample was initially clear and colorless, but became moderately turbid and light brown during collection.	12/7/99 @ 1015
997575	Water grab	Temporary well GW-12, located 30 ft south and 25 ft west of the southwest corner of the house located at [REDACTED]. Sample was clear and colorless.	12/7/99 @ 1035
997576	QA/QC sample (duplicate)	Duplicate sample of 997575, entered onto chain-of-custody as "Blind duplicate". Same description as above.	12/7/99 @ 1035
997577	Water grab	Temporary well GW-11, located 22 ft west and 7 ft north of the northwest corner of the house at [REDACTED] Place. Sample was clear and colorless.	12/7/99 @ 1050
997578	Water grab	Temporary well GW-10, located 12 ft north and 1 ft east of the northwest corner of the house at [REDACTED] Place. Sample was clear and colorless.	12/7/99 @ 1115
997579	Water grab	Temporary well GW-22, located 105 ft west of the west edge of Elmridge Place and 25 ft north of the north side of the building representing [REDACTED]. Sample was clear and colorless.	12/7/99 @ 1135
997580	Water grab	Temporary well GW-23, located 100 ft west of the west edge of Elmridge Place and 55 ft north of the north side of the building representing [REDACTED]. Sample was moderately turbid and light brown.	12/7/99 @ 1145
997581	Water grab	Temporary well GW-25, located 105 ft west of the west edge of Elmridge Place and 28 ft north of the north side of the building representing [REDACTED]. Sample was clear and colorless.	12/7/99 @ 1200
997582	Water grab	Temporary well GW-08, located approximately 25 ft east of the southeast corner of the house at [REDACTED]. Sample was clear and colorless.	12/7/99 @ 1210
997583	QA/QC sample (duplicate)	Duplicate sample of 997582, entered onto chain-of-custody as "Blind duplicate". Same description as above.	12/7/99 @ 1210

**Table 3. Selected Analytical Results for Groundwater Samples  
Chicago Heights Blvd VOC Plume PA/SI  
November 29- December 1, 1999, December 7, 1999**

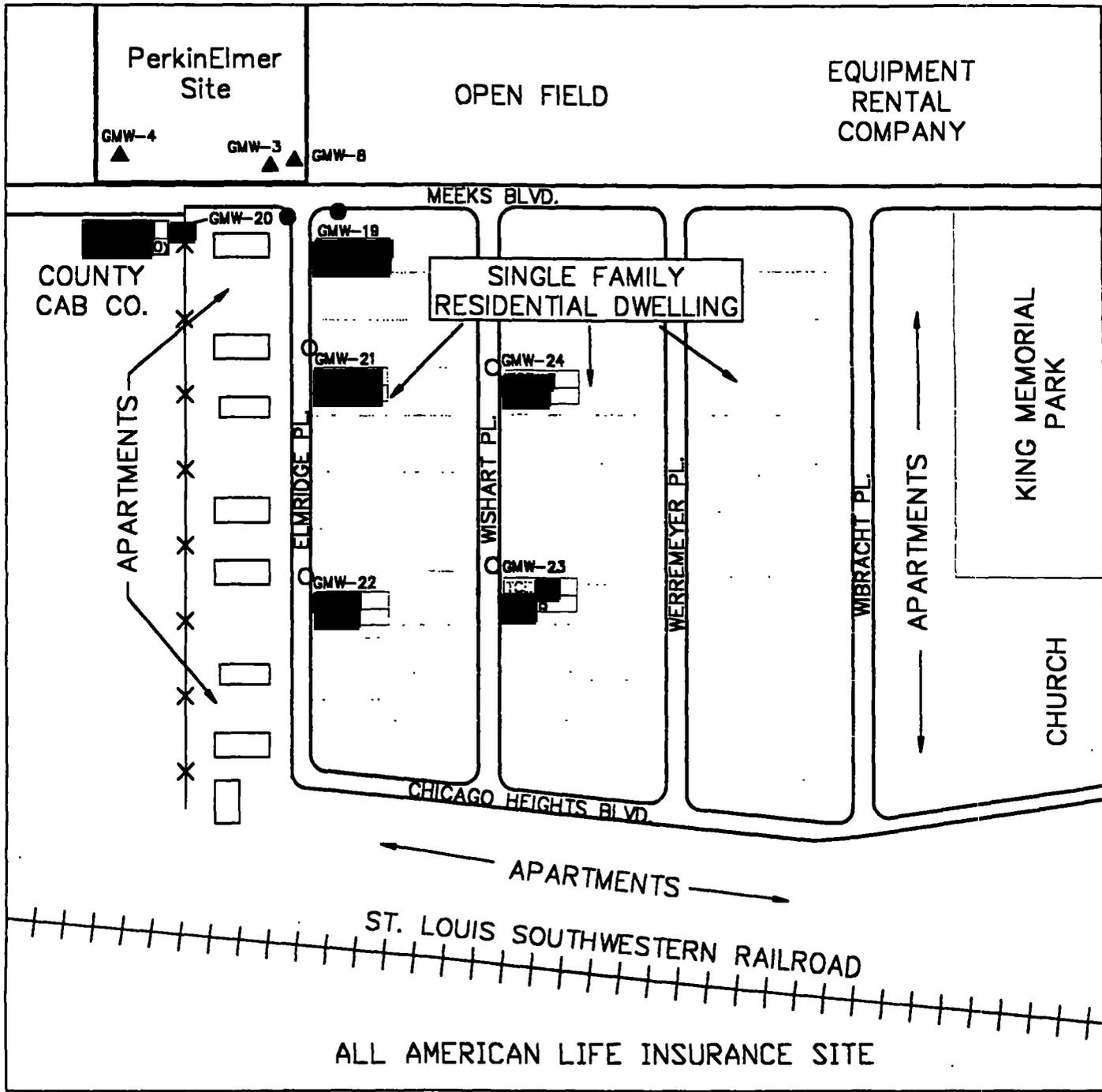
- All values are in parts per billion (ug/L or ppb) unless otherwise noted.
- Shaded values are those above detection limits.
- Bold values are those above the lowest SCDM health-based benchmarks for drinking water.
- SCDM health-based benchmarks for drinking water are included as a basis for comparison, even though the groundwater is not used for a drinking water supply at this site.

Sample # Well #	ANALYTE (And lowest SCDM Benchmark Values)						
	PCE ( 1.6 )	TCE ( 5.0 )	1, 1-DCE ( 0.14 )	Cis-1, 2- DCE ( 70 )	Trans-1, 2-DCE ( 100 )	1, 1, 2- TCA ( 1.5 )	Vinyl Chloride ( 0.04 )
	<1.0	2.1	<1.0	24.6	<1.0	<1.0	8.7
	<b>716</b>	<b>367</b>	<b>1.6</b>	<b>369</b>	<b>4.3</b>	<1.0	<b>10.6</b>
	1.2	<b>51.6</b>	<1.0	9.2	<1.0	<1.0	<2.0
	<b>2.4</b>	1.4	<1.0	<1.0	<1.0	<1.0	<2.0
	1.5	1.3	<1.0	<1.0	<1.0	<1.0	<2.0
	<1.0	<1.0	<1.0	2.2	<1.0	<1.0	<b>3.4</b>
	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
	<1.0	1.1	<1.0	2.4	<1.0	<1.0	<2.0
	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
	<b>2.5</b>	<b>1,140</b>	<b>1.9</b>	<b>149</b>	<1.0	<b>1.7</b>	<2.0
	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
	1.1	<b>6.7</b>	<1.0	<1.0	<1.0	<1.0	<2.0
	<b>1.6</b>	2.3	<1.0	18.4	<1.0	<1.0	<2.0
	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
	<1.0	<b>64.8</b>	<1.0	21.3	<1.0	<1.0	<2.0
	<1.0	4.5	<1.0	<1.0	<1.0	<1.0	<2.0
	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
	<1.0	<b>10.3</b>	<1.0	5.5	<1.0	<1.0	<2.0

## APPENDIX D

PerkinElmer Site – Monitoring Well Installation, March 2001

- Figure 1. Monitoring Well Locations and VOC Concentrations
- Figure 2. Piezometric Surface Elevation
- Figure 3. Northwest to Southeast Cross Section



**LEGEND**

- ▲ Existing Shallow Monitoring Well
- Existing Deep Monitoring Well
- New Deep Monitoring Well
- Filter between well and Tetrachloroethene Concentration (ug/L)



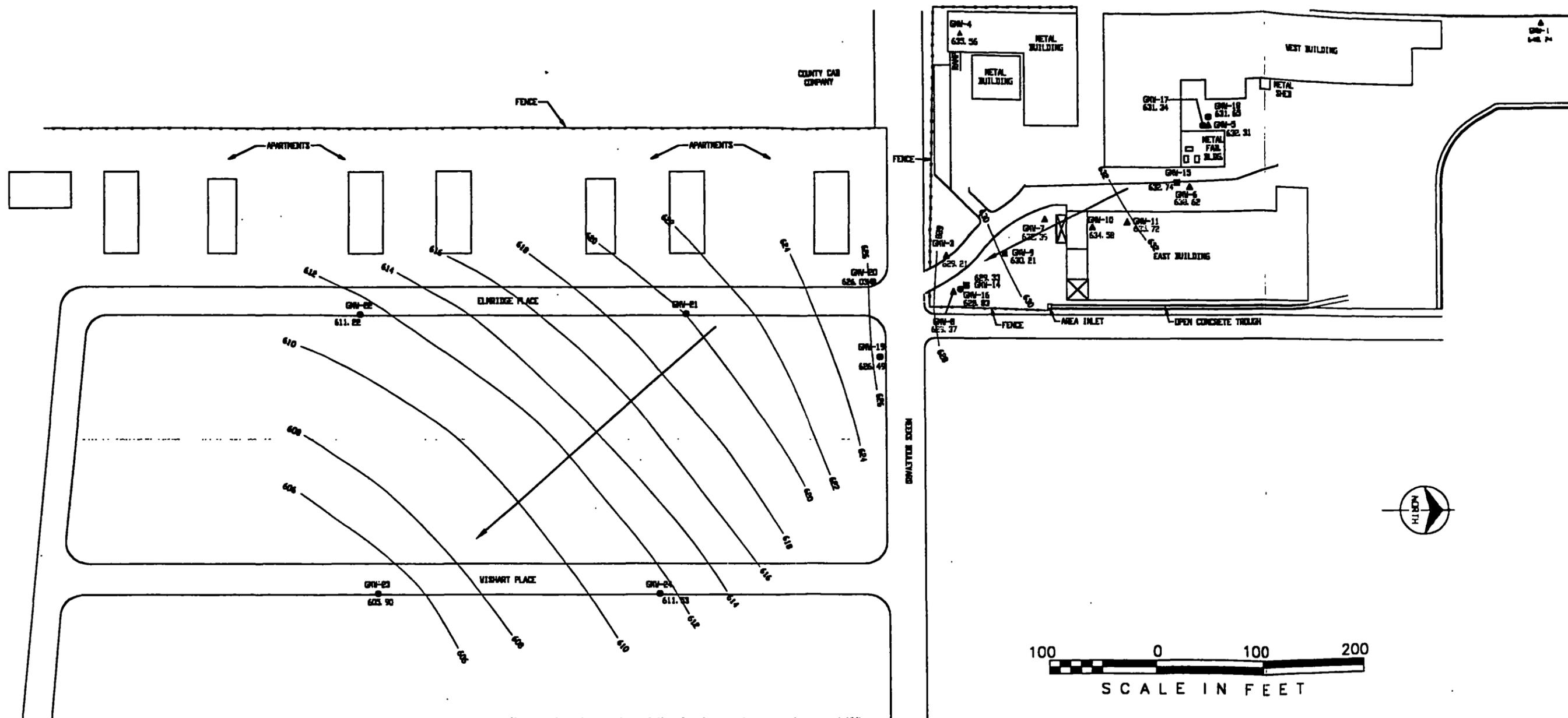
SR Figure 1, Appendix D  
Chicago Heights Blvd VOC Plume  
St. Louis County, Missouri



VOC CONCENTRATIONS  
IN GROUNDWATER  
MARCH 2001  
PerkinElmer  
Missouri Metals Site  
Overland, Missouri

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TSS 300  
PCR 260



**LEGEND**

- ▲ SHALLOW WELLS: SCREENED IN LOESS  
648. 24 PIEZOMETRIC SURFACE ELEVATION IN LOESS UNIT (FT)
  - INTERMEDIATE WELLS: SCREENED IN LOWER PORTION OF LOESS AND/OR UPPER PORTION OF SILTSTONE
  - DEEP WELLS: SCREENED IN DEEPER PORTION OF SILTSTONE  
626. 49 PIEZOMETRIC SURFACE ELEVATION IN SILTSTONE UNIT (FT)
- NOTE: GMW-18 IS SCREENED IN UPPER PORTION OF SILTSTONE BUT FILTER PACK EXTENDS TO LOWER PORTION OF LOESS

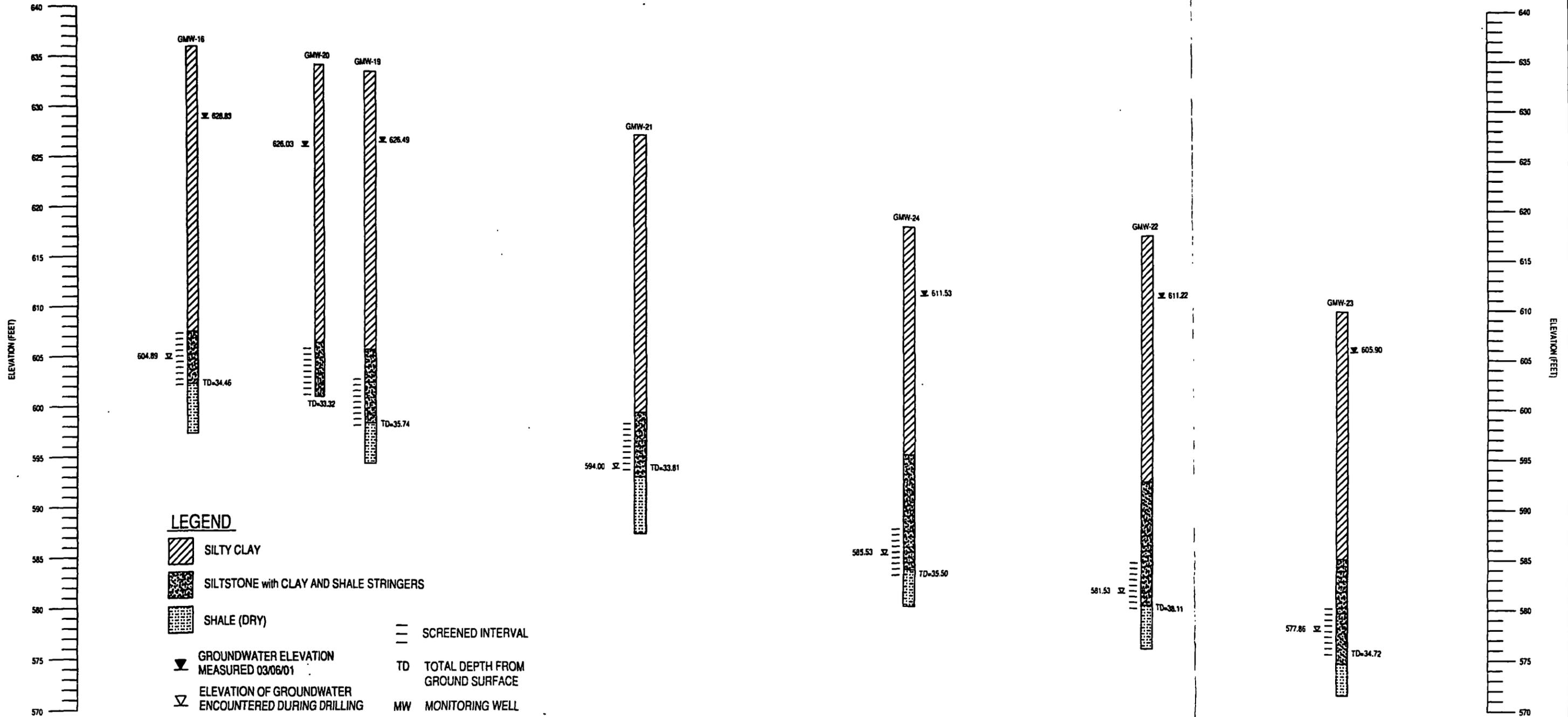
- ← GROUNDWATER FLOW DIRECTION
- 608 GROUNDWATER CONTOUR

	<p>Figure 2 PIEZOMETRIC SURFACE ELEVATION IN SILTSTONE UNIT MARCH 2001</p>
	<p>PerkinElmer Missouri Metals Site Overland, Missouri</p>

NORTHWEST

LOOKING NORTHEAST

SOUTHEAST



VERTICAL SCALE



HORIZONTAL SCALE



Figure 3  
CROSS-SECTION A-A'  
PerkinElmer  
Missouri Metals Site  
Overland, Missouri

APPENDIX E

Chicago Heights Blvd VOC Plume Site  
Photographs 1 - 11



Photo 1. Chicago Heights Blvd VOC Plume site, St. Louis County, MO. Photo taken on November 31, 1999 by Nancy Priddy, Superfund, DNR. View of site area taken from intersection of Chicago Heights Blvd and Elmridge Place, looking north, up Elmridge toward Meeks Boulevard.



Photo 2. Chicago Heights Blvd VOC Plume site, St. Louis County, MO. Photo taken on November 31, 1999 by Nancy Priddy, Superfund, DNR. View of site area from intersection of Chicago Heights Boulevard and Elmridge Place, looking east along Chicago Heights Blvd.



Photo 3. Chicago Heights Blvd VOC Plume site, St. Louis County, MO. Photo taken on November 31, 1999 by Nancy Priddy, Superfund, DNR. View of site area from Chicago Heights Boulevard, looking north, up Wishart Place.



Photo 4. Chicago Heights Blvd VOC Plume site, St. Louis County, MO. Photo taken on November 31, 1999 by Nancy Priddy, Superfund, DNR. Taken from southwest corner of site, looking north along western border of residential area. Apartments are on right.



Photo 5. Chicago Heights Blvd VOC Plume site, St. Louis County, MO. Photo taken on December 1, 1999 by Nancy Priddy, Superfund, DNR. Northwest corner of site, looking south along western border. Fence is on right, obscured by vegetation.



Photo 6. Chicago Heights Blvd VOC Plume site, St. Louis County, MO. Photo taken on December 1, 1999 by Nancy Priddy, Superfund, DNR. Meeks Boulevard along northern border of site. Taken from northwest looking east. Note change in Photo 11.



Photo 7. Chicago Heights Blvd VOC Plume site, St. Louis County, MO. Photo taken on December 1, 1999 by Nancy Priddy, Superfund, DNR. Adjacent commercial businesses west of northwest corner of site. Taken from north side of Meeks Boulevard looking southwest.



Photo 8. Chicago Heights Blvd VOC Plume site, St. Louis County, MO. Photo taken on December 1, 1999 by Nancy Priddy, Superfund, DNR. View of industry north of site. Taken from Elmridge Place looking north.



Photo 9. Chicago Heights Blvd VOC Plume site, St. Louis County, MO. Photo taken on December 1, 1999 by Nancy Priddy, Superfund, DNR. View of industry northwest of site. Taken from northwest corner of site looking northwest.



Photo 10. Chicago Heights Blvd VOC Plume site, St. Louis County, MO. Photo taken on December 1, 1999 by Nancy Priddy, Superfund, DNR. Photo taken from south side of Meeks Boulevard looking south along fence line separating residential back yards between Elmridge Place and Wishart Place.



Photo 11. Chicago Heights Blvd VOC Plume site, St. Louis County, MO. Photo taken on April 24, 2001 by Nancy Priddy, Superfund, DNR. Meeks Boulevard along northern border of site. Taken from northwest looking east. Note change since date of Photo 6.

<b>EPA</b>	POTENTIAL HAZARDOUS WASTE SITE <b>FINAL STRATEGY DETERMINATION</b>	REGION <b>VII</b>	SITE NUMBER <b>MOSFN0703551</b>
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File this form in the regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency, Site Tracking System; Hazardous Waste Enforcement Task Force (EN-335); 401 M St., SW; Washington, D.C. 20460.

**I. SITE IDENTIFICATION**

A. SITE NAME <b>Chicago Heights Blvd VOC Plume</b>	B. STREET		
C. CITY <b>St. Louis County</b>	D. STATE <b>MO</b>	E. ZIP CODE <b>63132</b>	

**II. FINAL DETERMINATION**

Indicate the recommended action(s) and agency(ies) that should be involved by marking 'X' in the appropriate boxes.

RECOMMENDATION	Action Agency				
	Mark 'X'	EPA	STATE	LOCAL	PRIVATE
A. NO ACTION NEEDED	X	X	X		
B. REMEDIAL ACTION NEEDED, BUT NO RESOURCES AVAILABLE (If yes, complete Section III.)					
C. REMEDIAL ACTION (If yes, complete Section IV.)					
D. ENFORCEMENT ACTION (If yes, specify in Part E whether the case will be primarily managed by the EPA or the State and what type of enforcement action is anticipated.)					

**E. RATIONALE FOR FINAL STRATEGY DETERMINATION**

VOCs related to groundwater contamination are present in the sump water and in the indoor air in the basements of residences at the Chicago Heights Blvd VOC Plume site; however, the DOH has determined that the current levels of VOCs in the air samples are not expected to cause adverse health effects. Based on current site conditions, further CERCLA actions are not recommended at this time. The PRP for the adjacent PerkinElmer site should continue efforts to halt continuing off-site migration of VOCs into the residential area. The sump water and indoor air should continue to be monitored in the residences closest to the PerkinElmer site during their remediation efforts. The PerkinElmer site is currently undergoing remediation with DNR oversight.

F. IF A CASE DEVELOPMENT PLAN HAS BEEN PREPARED, SPECIFY THE DATE PREPARED (mo., day, & yr.)

G. IF AN ENFORCEMENT CASE HAS BEEN FILED, SPECIFY THE DATE FILED (mo., day, & yr.)

**H. PREPARER INFORMATION**

1. NAME <b>Nancy H. Priddy</b>	2. TELEPHONE NUMBER <b>(573) 751-8629</b>	3. DATE (mo., day, & yr.) <b>12/13/2001</b>
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**III. REMEDIAL ACTION TO BE TAKEN WHEN RESOURCES BECOME AVAILABLE**

List all remedial actions, such as excavation, removal, etc. to be taken as soon as resources become available. See instructions for a list of Key Words for each of the actions to be used in the spaces below. Provide an estimate of the approximate cost of the remedy.

A. REMEDIAL ACTION	B. ESTIMATED COST	C. REMARKS
	\$	
	\$	
	\$	
	\$	
	\$	
D. TOTAL ESTIMATED COST		
	\$	

**IV. REMEDIAL ACTIONS**

**A. SHORT TERM/EMERGENCY ACTIONS (On Site and Off-Site):** List all emergency actions taken or planned to bring the site under immediate control, e.g., restrict access, provide alternate water supply, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE mo, day, yr	3. ACTION END DATE mo, day, yr	4. ACTION AGENCY EPA, State, Private Party	5. COST	6. SPECIFY 311 OR OTHER ACTION; INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				\$	
				\$	
				\$	
				\$	
				\$	
				\$	

**B. LONG TERM STRATEGY (On Site and Off-Site):** List all long term solutions, e.g., excavation, removal, ground water monitoring wells, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE mo, day, yr	3. ACTION END DATE mo, day, yr	4. ACTION AGENCY EPA, State, Private Party	5. COST	6. SPECIFY 311 OR OTHER ACTION; INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				\$	
				\$	
				\$	
				\$	
				\$	
				\$	

**C. MANHOURS AND COST BY ACTION AGENCY**

1. ACTION AGENCY	2. TOTAL MAN-HOURS FOR REMEDIAL ACTIVITIES	3. TOTAL COST FOR REMEDIAL ACTIVITIES
a. EPA		\$
b. STATE		\$
c. PRIVATE PARTIES		\$
d. OTHER(specify):		\$



April 13, 2001

Mr. R. Lance Livesay  
Missouri Department of Natural Resources  
Hazardous Waste Program  
P.O. Box 176  
Jefferson City, MO 65102

**Re: Phase II-Off-Site Monitoring Well Installation  
PerkinElmer, Missouri Metals Site, Overland, Missouri**

Dear Mr. Livesay:

The following letter summarizes the results of the Phase II off-site bedrock monitoring well installation and sampling activities conducted by Burns & McDonnell near the PerkinElmer Missouri Metals Site (site) located in Overland, Missouri. The bedrock monitoring well installation and sampling activities were conducted to determine the extent of contamination present in the shallow bedrock unit downgradient from the site.

## **WELL INSTALLATION AND COMPLETION**

### **Drilling Activities**

On February 26 through March 1, 2001, Burns & McDonnell personnel provided oversight during the installation of four bedrock monitoring wells in the residential area near the site (see Figure 1). Roberts Environmental Drilling, Inc. (Roberts) of Millstadt, Illinois provided drilling and monitoring well installation services. Each boring was advanced through the overburden and bedrock using hollow stem auger (HSA) drilling and continuous sampling techniques. Burns & McDonnell personnel recorded a continuous log of subsurface materials encountered in each boring by observing soil samples. Copies of the boring logs and field notes are given in Attachment 1.

The targeted zone for each monitoring well was the siltstone unit located just below the overburden at the site. Each monitoring well was installed by advancing an 8.75-inch diameter borehole to total depth. The targeted depth for each monitoring well was similar to GMW-19 and GMW-20 located just south of the site (see Figure 1). Monitoring wells GMW-19 and GMW-20 were completed near the base of the targeted siltstone unit at a depth of approximately 34 feet below ground surface (ft., bgs). The actual total depth for each newly installed monitoring well was determined in the field by examining continuous soil samples.

In order to ensure proper placement of the well screen, each boring was over-drilled to a total depth of 38 to 42 feet. The dry shale formation, which serves as an aquitard, was penetrated by approximately 5 feet in each boring. Based on drill-cuttings, the siltstone unit transitioned into a



Mr. Lance Livesay  
April 13, 2001  
Page 2

shale unit at approximately 34 to 37 ft., bgs. In order to place the well screen within the siltstone unit, each boring was backfilled with approximately 4 to 6 feet of bentonite chips.

After allowing the bentonite chips to hydrate for 1 hour, approximately 0.5 foot of fine sand was placed on top of the bentonite chips before setting the well. This resulted in total depths of approximately 33 to 38 ft., bgs for the four new wells. Due to time constraints, Missouri Department of Natural Resources (MDNR) personnel waived the required 1 hour waiting period for bentonite hydration for 3 of the 4 wells.

### Well Completion

Monitoring well construction diagrams are included on each boring log (see Attachment 1). Each monitoring well consisted of schedule 40, 2-inch PVC, threaded screen and riser. Each well was completed with 5 feet of 0.01-inch slot PVC well screen and a slip end cap. Following placement of the well screen and casing, a sand filter pack was tremied into place to fill the annular space to approximately 1 to 3 feet above the top of the well screen. Approximately 3 feet of bentonite chips were placed on top of the sand filter pack and allowed to hydrate for one hour. After allowing the bentonite seal to hydrate, a high solids bentonite grout was tremied into the remaining annular space to approximately 1 ft., bgs.

After the bentonite chips had hydrated and the bentonite grout had cured overnight, each well was completed with a flush-mounted, 8-inch well vault secured in concrete. A lockable expandable plug was placed in the top of the riser pipe to prevent debris and surface water from entering the well.

## **WELL DEVELOPMENT AND SAMPLING**

### Monitoring Well Development

Since no water was introduced to any of the boreholes during drilling, the required development volume for each monitoring well was 3-times the well volume measured prior to development. The required volume of water was removed from each monitoring well by air lifting. Water quality parameters of temperature, pH, and specific conductivity were measured during development and recorded in the field logbook by Burns & McDonnell personnel (see Attachment 1). Water quality parameters stabilized within ten percent before development was completed

The only exception to the above was GMW-21, which contained approximately 20 feet of groundwater following well completion. During development, GMW-21 became dry before the required volume of water was removed. After allowing more water to accumulate in the well, GMW-21 was surged with a bailer and then bailed until dry again. A total of approximately 6 gallons of groundwater was bailed from GMW-21 prior to sample collection. This volume was sufficient to remove groundwater from the well casing and the surrounding sand filter pack. Groundwater representative of the target formation was allowed to accumulate in the well to



Mr. Lance Livesay  
April 13, 2001  
Page 3

sample collection. A total of approximately 7 gallons of groundwater has been removed from GMW-21 to date and the well continues to recharge at a slow rate. The slow rate of recharge may be caused by the water-bearing zone being located near the bottom of the well screen.

#### **Monitoring Well Sampling**

GMW-19 through GMW-24 were sampled on March 2, 2001. GMW-21 through GMW-24 were sampled immediately after development (see above). Burns & McDonnell personnel attempted to purge three well volumes of groundwater from wells GMW-19 and GMW-20 prior to sample collection. Due to slow well recharge, GMW-19 and GMW-20 were purged until dry and then sampled. Water quality parameters of temperature, pH, and specific conductivity were measured and recorded in the field logbook during purging and prior to sampling for each well (see Attachment 1). Water quality parameters stabilized within ten percent before samples were collected.

Each groundwater sample was collected in two 40-ml vials and placed in a cooler with ice. A trip blank was also included with the samples for QA/QC analysis. Each sample container was properly labeled and shipped to the laboratory under proper Chain-of-Custody procedures. The laboratory analyzed each sample for halogenated VOC's using USEPA Method 8021B.

#### **WATER LEVEL MEASUREMENTS**

Water level measurements were collected from all on-site and off-site monitoring wells on March 6, 2001. The aquifer was allowed to stabilize from well installation and sampling activities for approximately 48 hours before water levels were measured. The static groundwater elevation in each monitoring well was measured using a decontaminated water level indicator. The water level measurements were collected to determine the overall groundwater flow direction in the area. The piezometric surface elevation at each monitoring well is illustrated in Figure 2. The general direction of groundwater flow for the aquifer within the siltstone unit is northwest to southeast. The overlying silty-clay (loess) formation has the same general groundwater flow direction.

A cross-section (see Figure 3) has been included with this report to illustrate the existing subsurface conditions in the off-site area. Cross-Section A-A' progresses along line A-A' (see Figure 1) from northwest to southeast. On-site monitoring well GMW-16 and all of the off-site monitoring wells are projected onto the cross-section to display lithology contacts, groundwater elevation, screened interval, and total depth elevation. The water-bearing siltstone unit and the underlying shale unit (an aquitard) dip to the southeast. The cross-section shows that each well was screened within the siltstone unit, below the silty-clay formation.

#### **RESULTS**

The groundwater analytical results are summarized in Table 1. A Burns & McDonnell chemist performed a QA/QC analysis of the laboratory data, and no data required qualification as a result



Mr. Lance Livesay  
April 13, 2001  
Page 4

of this review (see Attachment 2). The results indicate detections of trichloroethene (TCE) in GMW-19 through GMW-24, and detections of tetrachloroethene (PCE) in each of these wells except GMW-20. The TCE and PCE concentrations for the off-site wells are illustrated in Figure 4.

The results also indicate detections of cis-1,2-dichloroethene (DCE) (a daughter product of PCE and TCE) in GMW-19, GMW-20, and GMW-24, and an estimated detection of cis-1,2-DCE in GMW-23. Estimated detections of methylene chloride were also reported for GMW-21 and GMW-23, but this analyte is a common laboratory contaminant, and likely not present in the groundwater at the site.

The results of this investigation indicate that the extent of the plume within the shallow bedrock unit downgradient from the site has been defined with the newly installed monitoring wells. The laboratory results indicate that the three outer monitoring wells (GMW-22, GMW-23, & GMW-24) are located at the margins of the plume, and thus, there is no need for further plume delineation in the area at this time.

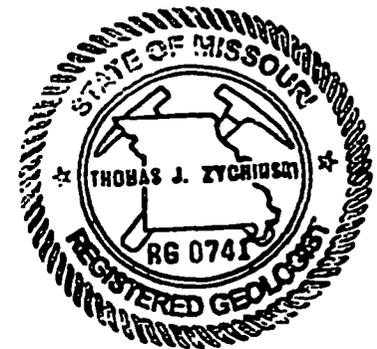
If you have any questions or comments, please contact me at (816) 822-3224.

Sincerely,

Tom Zychinski  
Project Manager

Attachments

Cc: Jack Healy, PerkinElmer, Inc.  
Keith Rosenstiel, PerkinElmer, Inc.



**Tables**

**Table 1  
GROUNDWATER SAMPLING RESULTS  
Phase II Off Site Monitoring Wells  
PerkinElmer, Missouri Metals Site  
March 2001**

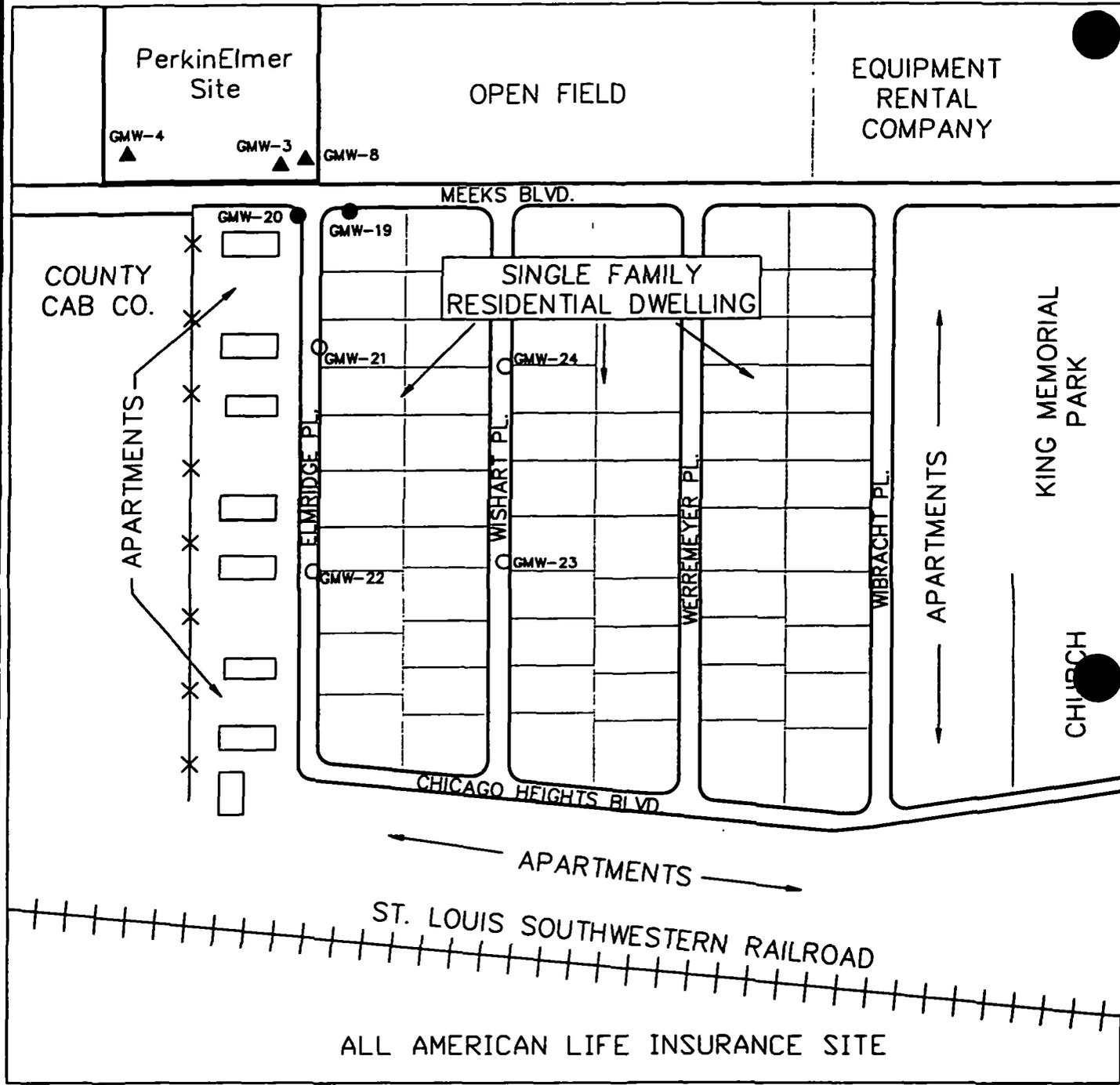
Contaminant	Units	Monitoring Well					
		█	█	█	█	█	█
Methylene Chloride	µg/L	ND(500)	ND(50)	37 J	ND(1)	0.6 J	ND(1)
TCE	µg/L	4300	1700	360	6	26	17
cis-1,2-DCE	µg/L	1200	400	ND(50)	ND(1)	0.8 J	2
PCE	µg/L	260 J	ND(50)	170	2	8	4

**Notes:**

J - estimated value, below reporting limit

ND(1000) - Not detected(analyte reporting limit)

**Figures**



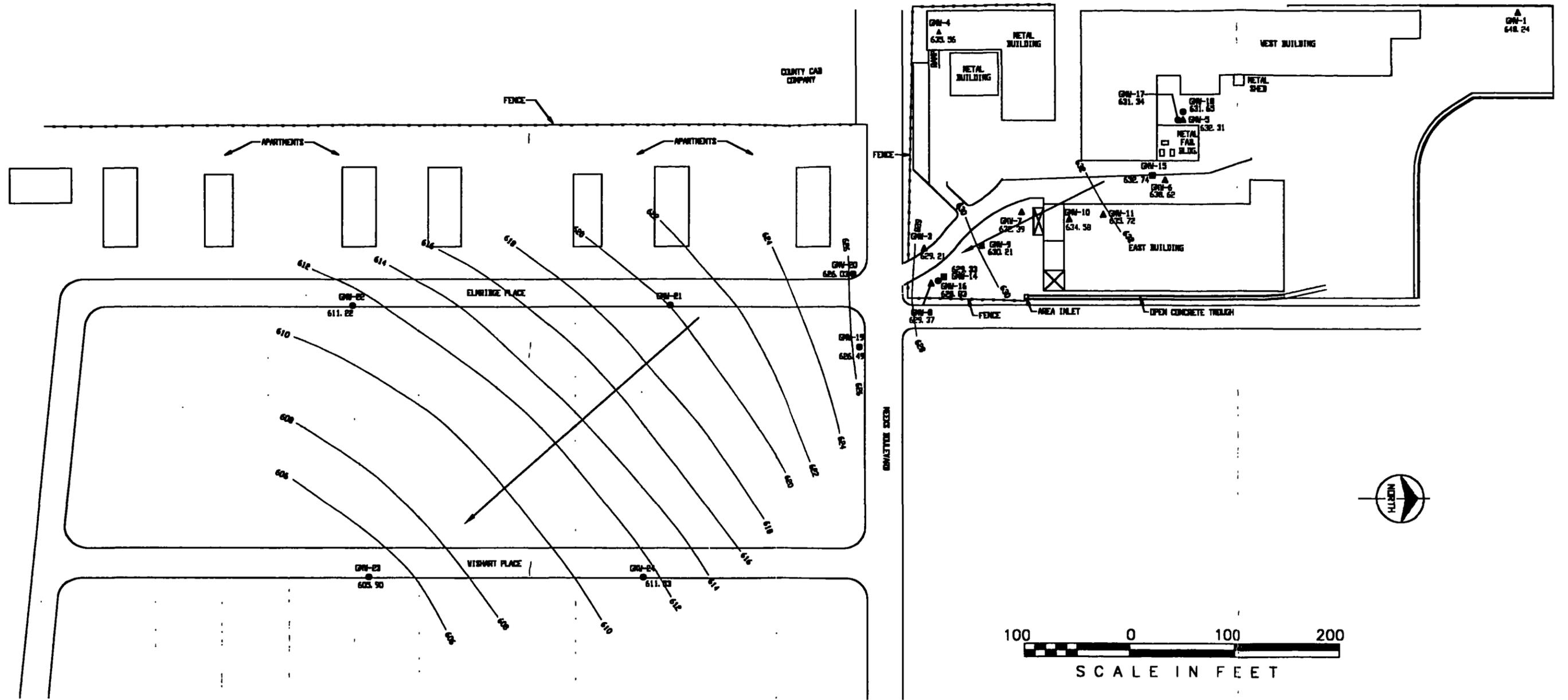
**LEGEND**

- ▲ Existing Shallow Monitoring Well
- Existing Deep Monitoring Well
- New Deep Monitoring Well



Figure 1  
**MONITORING WELL  
 LOCATION PLAN**  
 PerkinElmer  
 Missouri Metals Site  
 Overland, Missouri

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**LEGEND**

- ▲ SHALLOW WELLS; SCREENED IN LOESS  
648.24 PIEZOMETRIC SURFACE ELEVATION IN LOESS UNIT (FT)
  - INTERMEDIATE WELLS; SCREENED IN LOWER PORTION OF LOESS AND/OR UPPER PORTION OF SILTSTONE
  - DEEP WELLS; SCREENED IN DEEPER PORTION OF SILTSTONE  
626.49 PIEZOMETRIC SURFACE ELEVATION IN SILTSTONE UNIT (FT)
- NOTE: GMW-18 IS SCREENED IN UPPER PORTION OF SILTSTONE BUT FILTER PACK EXTENDS TO LOWER PORTION OF LOESS

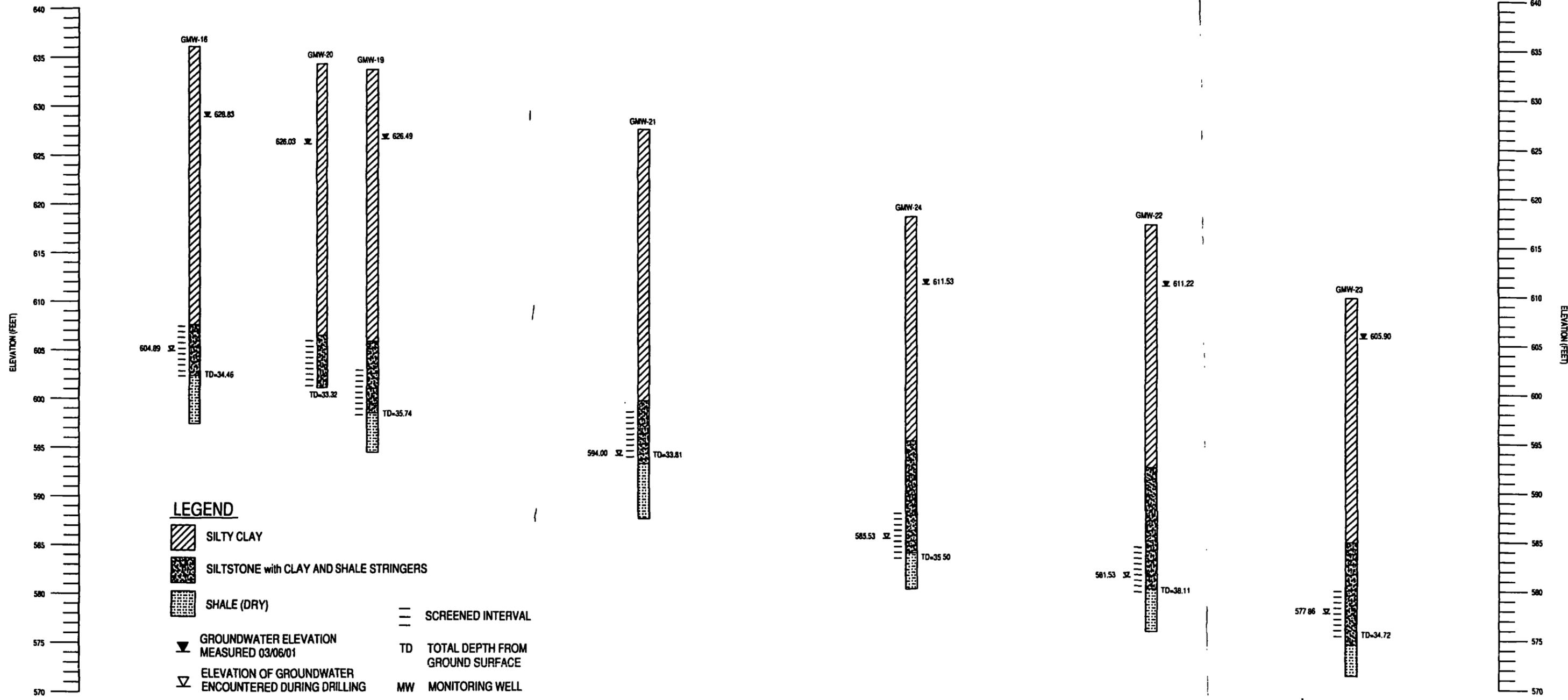
- ← GROUNDWATER FLOW DIRECTON
- 608 GROUNDWATER CONTOUR

	<p>Figure 2 PIEZOMETRIC SURFACE ELEVATION IN SILTSTONE UNIT MARCH 2001</p>
	<p>PerkinElmer Missouri Metals Site Overland, Missouri</p>

NORTHWEST

LOOKING NORTHEAST

SOUTHEAST



VERTICAL SCALE



HORIZONTAL SCALE



Figure 3  
CROSS-SECTION A-A'  
PerkinElmer  
Missouri Metals Site  
Overland, Missouri

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**ATTACHMENT 1**

**Boring Logs  
Field Notes**

# Drilling Log

Project Name <b>PKI</b>		Project Number <b>26682</b>		Boring Number <b>GMW-21</b>	
Ground Elevation		Location <b>1476 Elmridge Place</b>		Page <b>1</b> of <b>3</b>	
Air Monitoring Equipment <b>580B OVM</b>				Total Footage <b>40'</b>	
Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. Of Samples	No. Of Core Boxes
<b>HSA</b>	<b>8.75-inch</b>	<b>26.3</b>	<b>13.7</b>	<b>14</b>	<b>—</b>
Drilling Company <b>Roberts Environ. Drilling</b>			Driller (s) <b>Joc Cox, Joey Brown</b>		
Drilling Rig			Type of Sampler <b>CME Continuous Sampler / Split-Spoon</b>		
Date <b>2/26/01</b>		To <b>2/26/01</b>		Field Observer (s) <b>John Heseemann</b>	

Depth (feet)	Description	Class	Blow Count	Recov.	Run/Time	Sample Desig.	PID (ppm)			Remarks/ Water Levels				
							BZ	BH	S					
1	Silty-clay, damp, medium stiff, dark yellowish-brown (10YR-4/4), non plastic becomes greenish-gray (5BG-5/1), medium plastic mottled black, medium plastic, with some concrete, glass, and brick debris				0710	CS 1			0					
2											3'	0	0	0
3											3.5'			
4														
5		0911	0	0	0									
6	becomes gray (5Y-5/1), with some FeO staining	CL			0917	CS 2	0	0	0					
7											1'			
8											5'			
9					0920	CS 3	0	0	0					
10											0.5'	0927		
11					0929									
12					0940									

BZ=Breathing Zone    BH=Bore Hole    S=Sample

# Drilling Log Continuation

							Boring Number <i>GMW-21</i>									
Project Name <i>PKI</i>							Page <i>2</i> of <i>3</i>									
Project Number <i>26682</i>							Date <i>2/26/01</i>									
Depth (feet)	Description	Class	Blow Count	Recov.	Run/Time	Sample Desig.	PID (ppm)			Remarks/ Water Levels						
							BZ	BH	S							
15	<i>silty-clay, moist, soft, brown (10YR-5/3), medium to highly plastic, with some FeO staining and trace very fine sand</i>					<i>CS</i>				<i>0</i>	<i>water in CAIE sampler</i>					
16												<i>1.5' / 5'</i>	<i>4</i>	<i>0</i>	<i>0</i>	<i>0</i>
17																
18	<i>with light gray silt lenses</i>	<i>CL</i>														
19												<i>0941</i>				
20												<i>0947</i>				
21					<i>1.5' / 5'</i>	<i>CS</i>	<i>5</i>	<i>0</i>	<i>0</i>	<i>0</i>						
22																
23																
24	<i>stiff, gray (N-6), medium plastic with fractured SILTSTONE fragments: gray and red, and FeO staining</i>		<i>4</i>	<i>0.8' / 2'</i>	<i>1002</i>			<i>0</i>	<i>0</i>	<i>0</i>	<i>Switching to split-specimen sampling due to low recov. w/ CAIE sampler</i>					
25												<i>9</i>	<i>SS</i>			
26												<i>8</i>		<i>6</i>		
27	<i>SHALE: dark reddish-brown (10R-7/4), mottled light gray, extremely very stiff, damp, extremely weathered, weak</i>		<i>2</i>	<i>1.8' / 2'</i>	<i>1007</i>	<i>SS</i>	<i>7</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>rocky drilling at 24 ft.</i>					
28												<i>4</i>	<i>SS</i>			
29												<i>10</i>		<i>1.6' / 2'</i>	<i>8</i>	
30	<i>SILTSTONE: pale greenish yellow (10Y-8/2), hard, dry, mod. weathered, weak, with red and yellow streaking, trace very fine sand, and lenticular bedding</i>		<i>4</i>	<i>1.8' / 2'</i>	<i>1012</i>	<i>SS</i>	<i>9</i>	<i>0</i>	<i>0</i>	<i>0</i>						
31												<i>6</i>				
												<i>13</i>	<i>1021</i>	<i>9</i>		
			<i>32</i>													

BZ=Breathing Zone    BH=Bore Hole    S=Sample

US EPA ARCHIVE DOCUMENT



# Drilling Log

Project Name <b>PKI</b>		Project Number <b>26682</b>		Boring Number <b>GMW-22</b>	
Ground Elevation		Location <b>1436 Elmridge Place</b>		Page <b>1</b> of <b>4</b>	
Air Monitoring Equipment <b>580 B OUM</b>				Total Footage <b>42</b>	
Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. Of Samples	No. Of Core Boxes
<b>HSA</b>	<b>8.75" inch</b>	<b>26.6</b>	<b>15.4</b>	<b>16</b>	<b>0</b>
Drilling Company <b>Roberts Environ. Drilling</b>			Driller (s) <b>Joe Cox, Joey Brown</b>		
Drilling Rig			Type of Sampler <b>CME Continuous Sampler / split spoon</b>		
Date <b>2/27/01</b>		To <b>2/27/01</b>		Field Observer (s) <b>John Hescmann</b>	

Depth (feet)	Description	Class	Blow Count	Recov.	Run/Time	Sample Desig.	PID (ppm)			Remarks/ Water Levels
							BZ	BH	S	
1	silty-clay, damp, medium stiff, dark yellowish brown (10YR-4/4), trace plasticity, with some FeO staining	CL			0959				0	
2				23'		CS				
3	Sand, poorly-graded, fine, clean (sewer backfill)	SP		4'		1	0		0	
4					0956					
5	Clayey-silt, damp, soft, gray (2.5Y-5/1), non plastic, mottled olive brown	ML			1001				0	
6										
7	silty-clay, damp, stiff, dark grayish brown (2.5Y-4/2), medium plastic, with lenticular bedding			29'		CS	0		0	
8				5'		2			0	
9					1003					
10	becomes medium stiff, yellowish brown (10YR-5/4), with some FeO staining	CL			1009				0	
11										
12				5'		CS			0	
13				5'		3	0	0	0	
14	becomes very stiff, dark yellowish brown (10YR-4/2), heavily FeO stained (lower 1/2 silt)				1011				0	

BZ=Breathing Zone    BH=Bore Hole    S=Sample

# Drilling Log Continuation

							Boring Number <i>GMW-22</i>				
Project Name <i>PKI</i>							Page <i>2</i> of <i>4</i>				
Project Number <i>26682</i>							Date <i>2/27/01</i>				
Depth (feet)	Description	Class	Blow Count	Recov.	Run/Time	Sample Desig.	PID (ppm)			Remarks/ Water Levels	
							BZ	BH	S		
15	<i>Silty-clay, damp, medium stiff, yellowish brown (10Y-5/4), medium plastic, with lenticular bedding, FeO and MnO<sub>2</sub> staining</i>	<i>CL</i>			<i>1016</i>				<i>0</i>		
16				<i>5' / 5'</i>		<i>CS 4</i>	<i>0</i>	<i>0</i>	<i>0</i>		
17										<i>0</i>	
18			<i>becomes heavily MnO<sub>2</sub> stained</i>							<i>0</i>	
19					<i>1018</i>				<i>0</i>		
20					<i>1024</i>				<i>0</i>		
21				<i>3' / 3'</i>		<i>CS 5</i>	<i>0</i>			<i>Rocky drilling at 20.5'</i>	
22	<i>Clayey-gravel, damp, medium dense, coarse grained chert and silt stone gravel</i>	<i>GC</i>			<i>1039</i>				<i>0</i>		
23	<i>@ 21.8': becomes fine to medium grained</i>		<i>11</i>	<i>1.8'</i>	<i>1049</i>	<i>SS</i>			<i>0</i>	<i>Auger/CME sampler refusal at 22'</i>	
24	<i>clayey-silt, dry, hard, greenish-gray (10Y-6/1), non-plastic, with some FeO and MnO<sub>2</sub> staining</i>	<i>ML</i>	<i>10</i>	<i>1/2'</i>		<i>6</i>	<i>0</i>		<i>0</i>	<i>Switched over to split-spoon sampling</i>	
25	<i>SHALE: reddish brown (10YR-3/4), dry to damp, very stiff to hard, moderately weathered, weak</i>		<i>12</i>		<i>1051</i>				<i>0</i>		
26	<i>SILTSTONE: light olive brown (2.5Y-5/6), dry, hard, mottled greenish gray, dry, hard, extremely weathered, weak, with FeO staining and trace very fine sand</i>		<i>14</i>		<i>1057</i>	<i>SS</i>	<i>0</i>	<i>0</i>	<i>0</i>		
27			<i>4</i>	<i>2' / 2'</i>	<i>1100</i>	<i>7</i>			<i>0</i>		
28			<i>7</i>		<i>1106</i>	<i>SS</i>			<i>0</i>		
29	<i>@ 26.6': becomes reddish brown (10YR-3/4), moderately weathered</i>		<i>16</i>	<i>2' / 2'</i>		<i>8</i>	<i>0</i>		<i>0</i>		
30			<i>30</i>		<i>1108</i>				<i>0</i>		
31	<i>becomes light olive brown (5Y-5/6)</i>		<i>42</i>		<i>1115</i>	<i>SS</i>			<i>0</i>		
			<i>13</i>	<i>0 / 2'</i>		<i>9</i>					
			<i>18</i>		<i>1117</i>						
			<i>19</i>		<i>1126</i>						
			<i>26</i>								

BZ=Breathing Zone    BH=Bore Hole    S=Sample

# Drilling Log Continuation

Project Name <b>PKI</b>		Boring Number <b>GMW-22</b>
Project Number <b>26682</b>		Page <b>3</b> of <b>4</b>
		Date <b>2/27/01</b>

Depth (feet)	Description	Class	Blow Count	Recov.	Run/Time	Sample Desig.	PID (ppm)			Remarks/ Water Levels
							BZ	BH	S	
32	SILTSTONE: light olive brown (5Y-5/6), dry, hard, moderately weathered, weak becomes dusky yellow (5Y-6/4) with trace very fine sand		12 32 59/6"	11/1.5'	1131	SS 10	0		0	
33			9 30 59/6"	1.5'/1.5'	1138	SS 11	0	0	0	
34			9 30	1.8'/2'	1151	SS 12			0	
35	becomes damp with wet seams, light olive brown (5Y-5/6)		37		1153		0	0	0	
36			8 16	1.4'/2'	1200	SS 13	0		0	water in sampler
37			12 22		1204					
38	SHALE: light olive brown (5Y-5/6), dry, hard, moderately weathered, weak, with FeO staining		15	9"/11"	1212	SS 14	0			
39			59/5"		1215					
40	becomes dark yellowish orange (10YR-6/6), slightly weathered, moderately strong, with reddish brown streaking		8 20	0.8'/2'		SS 16	0			1339 water @ 24'
41			42 30							
42		Bottom of Hole								
43										
44										

BZ=Breathing Zone    BH=Bore Hole    S=Sample

**US EPA ARCHIVE DOCUMENT**

# Drilling Log Continuation

Project Name <b>PKI</b>						Boring Number <b>GMW-22</b>	
Project Number <b>28682</b>						Page <b>4</b> of <b>4</b>	
						Date <b>2/27/01</b>	

Depth (feet)	Description	Class	Blow Count	Recov.	Run/Time	Sample Desig.	PID (ppm)			Remarks/ Water Levels
							BZ	BH	S	

BZ=Breathing Zone    BH=Bore Hole    S=Sample

# Drilling Log

Project Name <b>PKI</b>		Project Number <b>26682</b>		Boring Number <b>GMW-23</b>	
Ground Elevation		Location <b>1438 W. Short Place</b>		Page <b>1</b> of <b>3</b>	
Air Monitoring Equipment <b>580 B OVM</b>				Total Footage <b>38.7</b>	
Drilling Type <b>HSA</b>	Hole Size <b>8.75"</b>	Overburden Footage <b>38.7</b>	Bedrock Footage <b>24</b>	No. Of Samples <b>12</b>	No. Of Core Boxes <b>0</b>
Drilling Company <b>Roberts Environ. Drilling</b>			Order (s) <b>Joe Cox, Joey Brown</b>		
Drilling Rig			Type of Sampler <b>(ME Continuous sampler/split spoon)</b>		
Date <b>2/28/01</b>		To <b>2/28/01</b>		Field Observer (s) <b>John Hesse mann</b>	

Depth (feet)	Description	Class	Blow Count	Recov.	Run/Time	Sample Desig.	PID (ppm)			Remarks/ Water Levels
							BZ	BH	S	
1	Silty-clay FILL, damp, black, with crushed rock, brick, and glass debris	FILL				0937				
2	Silty-clay, damp, med			3.5'		CS			0	
3	soft, light olive brown (2.5Y-5/2), medium plastic			3.5'		1	0		0	
4						0940			0	
5						0946			0	
6	at 5.4': becomes light brownish gray (2.5Y-4/2) with FeO and MnO <sub>2</sub> staining and lenticular bedding	CL		2.8'		CS	0		0	
7				5'		2			0	
8	becomes medium stiff					0947			0	
9						0957			0	
10	becomes light olive brown soft, light olive brown (2.5Y-5/2)					CS	0	0	0	
11				5'		3			0	
12				5'					0	
13	becomes light brownish gray (2.5Y-4/2)					0959			0	
14						1004				

BZ=Breathing Zone    BH=Bore Hole    S=Sample

# Drilling Log Continuation

							Boring Number <i>GMW-23</i>			
Project Name <i>PKI</i>							Page <i>2</i> of <i>3</i>			
Project Number <i>26682</i>							Date <i>2/28/01</i>			
Depth (feet)	Description	Class	Blow Count	Recov.	Run/Time	Sample Desig.	PID (ppm)			Remarks/ Water Levels
							BZ	BH	S	
15	<i>Silty-clay, damp, medium stiff, light brownish gray (2.5x-4x), medium plastic with lenticular bedding, FeO and MnO<sub>2</sub> staining</i>	<i>CL</i>		<i>5' / 5'</i>		<i>CS 4</i>			<i>0</i>	
16							<i>0</i>	<i>0</i>		
17								<i>0</i>		
18								<i>0</i>		
19					<i>1006</i>			<i>0</i>		
20					<i>1015</i>			<i>0</i>		
21						<i>CS 5</i>		<i>0</i>	<i>0</i>	
22	<i>Clayey-gravel, med damp, medium dense, coarse grained with some coarse sand</i>	<i>GC</i>		<i>5' / 5'</i>					<i>0</i>	
23								<i>0</i>		
24								<i>0</i>		
25	<i>SHALE: light greenish gray (2.5-4x) with yellow and red streaking, damp, medium stiff</i>								<i>0</i>	
26								<i>0</i>		
27	<i>SILTSTONE: dark reddish brown, blocky structure (10R-3A) moderately weathered, moderately strong, with yellow streaking</i>			<i>5' / 5'</i>		<i>CS 6</i>			<i>0</i>	
28								<i>0</i>		
29								<i>0</i>		
30								<i>0</i>		
31					<i>1033</i>					
					<i>1049</i>			<i>55</i>	<i>Switch over to split spoons</i>	
			<i>50 / 5'</i>	<i>0 / 5'</i>		<i>7</i>				
					<i>1052</i>					
					<i>1100</i>					

BZ=Breathing Zone    BH=Bore Hole    S=Sample

# Drilling Log Continuation

Project Name <b>PKI</b>		Boring Number <b>GMW-23</b>
Project Number <b>26682</b>		Page <b>3</b> of <b>3</b>
		Date <b>2/28/01</b>

Depth (feet)	Description	Class	Blow Count	Recov.	Run/Time	Sample Desig.	PID (ppm)			Remarks/ Water Levels
							BZ	BH	S	
32	SILTSTONE: dark yellowish orange (10YR-4/6), dry, blocky structure, moderately weathered, moderately strong, with red staining		50 /5 <sup>0</sup>	0 /5 <sup>0</sup>		SS 8	0			
33					1105 1112					
33	@ 32': becomes highly fractured, weak		50 /6 <sup>0</sup>	6 /6 <sup>0</sup>		SS 9	0			
34	@ 32.2': 1/2" damp seam				1115					
35			10 23 38	2' /2'	1131	SS 10	0			
36	SHALE: dark yellowish orange (10YR-4/6), silty, dry, hard, moderately weathered, weak, with some slickensides		40		1133					
37		@ 37': becomes greenish gray (5GY-6/1)		8	1' /1'	1139	SS 11	0		
38					1144					
39	LIMESTONE: yellowish gray (5Y-7/2), fractured, moderately weathered, strong		50/20	20/20		SS-12				water in sampler and bore hole
40	Bottom of Hole GMW-23									
41										
42										

BZ=Breathing Zone    BH=Bore Hole    S=Sample

US EPA ARCHIVE DOCUMENT

# Drilling Log

Project Name <b>PKI</b>		Project Number <b>26682</b>		Boring Number <b>GMW-24</b>	
Ground Elevation		Location <b>1470 Wishart</b>		Page <b>1</b> of <b>3</b>	
AM Monitoring Equipment <b>580 B OVM</b>				Total Footage <b>38.5</b>	
Drilling Type	Hole Size	Oyerburden Footage	Bedrock Footage	No. Of Samples	No. Of Core Boxes
<b>HSA</b>	<b>8.75-inch</b>	<b>17.5</b>	<b>21</b>	<b>8</b>	<b>0</b>
Drilling Company <b>Roberts Environ. Drilling</b>			Driller (s) <b>Joe Cox, Joey Brown</b>		
Drilling Rig			Type of Sampler <b>CAF Continuous sampler Light span</b>		
Date <b>3/1/01</b>		To <b>3/1/01</b>		Field Observer (s) <b>John Hesemann</b>	

Depth (feet)	Description	Class	Blow Count	Recov.	Run/Time	Sample Desig.	PID (ppm)			Remarks/ Water Levels
							BZ	BH	S	
1	Silty-clay FILL, damp, stiff, dark grayish brown (2.5Y-4/2), medium plastic, with roots, and glass debris	FILL		3.5'	0:00	CS 1	0	0	0	
2	Silty-clay and asphalt FILL			3.5'			0	0	0	
3	Silty-clay, damp, medium stiff, light olive brown								0	
4	(2.5Y-5/3), medium plastic, with FeO and MnO <sub>2</sub> staining, and lenticular bedding								0	
5						CS 2			0	
6	becomes soft, light brownish gray (2.5Y-6/2)	CL		2.8' / 5'			0		0	
7									0	
8									0	
9									0	
10									0	
11						CS 3			0	
12	Clayey-silt, damp, medium stiff, yellowish brown (10YR-3/4), trace to medium plastic, with FeO and MnO <sub>2</sub> staining, and trace very fine sand	ML		5' / 5'			0	0	0	
13									0	
14										Water coming in borehole

BZ=Breathing Zone    BH=Bore Hole    S=Sample

# Drilling Log Continuation

	Boring Number <b>GMW-24</b>
Project Name <b>PXI</b>	Page <b>2</b> of <b>3</b>
Project Number <b>26652</b>	Date <b>3/1/01</b>

Depth (feet)	Description	Class	Blow Count	Recov.	Run/Time	Sample Desig.	PID (ppm)			Remarks/ Water Levels
							BZ	BH	S	
15	Silty-clay, damp, medium stiff, yellowish brown (10YR-5/4), trace plasticity, with FeO and MnO <sub>2</sub> staining, and fine sand	CL		5' /5'		CS 4	0	0	0	water in sampler
16										
17										
18	SHALE: greenish gray (10Y-6/1), damp, very stiff, moderately weathered, weak, with FeO staining, and some brown silt lenses @19.5': becomes heavily FeO @20.5': 0.5' chert gravel zone			5' /5'		CS 5	0		0	
19										
20										
21										
22										
23	becomes silty								0	
24	SILTSTONE: light greenish gray (5GY-7/1), dry, slightly weathered, moderately strong, with FeO staining @24': becomes dark yellowish orange (10YR-6/6), moderately weathered, weak, with red streaking			5' /5'		CS 6	0		0	
25										
26										
27									0	
28	SHALE: greenish gray (10GY-4/1), dry, hard, silty, moderately weathered, moderately strong, with yellow iron streaking									
29										
30										
31										

BZ=Breathing Zone    BH=Bore Hole    S=Sample

**US EPA ARCHIVE DOCUMENT**

# Drilling Log Continuation

							Boring Number <i>GMW-24</i>			
Project Name <i>PKT</i>							Page <i>3</i> of <i>3</i>			
Project Number <i>26682</i>							Date <i>3/1/01</i>			
Depth (feet)	Description	Class	Blow Count	Recov.	Run/Time	Sample Desig.	PID (ppm)			Remarks/ Water Levels
							BZ	BH	S	
32	- same as above -					CS 7				
33	with real dark reddish brown siltstone lenses and slicken sides			5' /5'					0	
34	SILTSTONE: dark yellowish orange (10YR-6/6), wet, highly fractured, moderately weathered, moderately strong									
35	SHALE: dark yellowish orange (10YR-6/6), wet, highly fractured, moderately weathered, moderately strong			5' /5'		CS 8			0	
36	dark reddish brown (10R-3/4), hard, dry, hard, moderately weathered, moderately strong									
37	work, with yellow streaking				1030					
38										
39	Bottom of Hole									
40	<div style="text-align: center;"> </div>									

BZ=Breathing Zone    BH=Bore Hole    S=Sample

3/6/01 26682 J. Heschmann

Well #	DTW	TD	Time
GMW-19	7.12		<del>1103</del> 1113
GMW-20	8.09		<del>1108</del> 1117
GMW-21	31.39		1121
GMW-22	6.31		1127
GMW-23	3.84		1135
GMW-24	6.79		1140
GMW-3	6.62		1030

Replaced <sup>locks on</sup> new wells with Abus locks.  
The location of GMW-10 is incorrect. Should well is approx. 5 ft. north of Pickle Room.

1150 John H. off-site.

~~John Heschmann~~

3/7/01 26682 J. Heschmann

1148 John H. on site. Weather is clear with light wind, approx ~ 40°.

Well #	DTW	TD	Time
GMW-21	31.27	33.50	1159 → Pressure on 5-Plug.
GMW-22	6.38	37.40	1215
GMW-23	3.90	<del>34.18</del> 34.46	1224
GMW-24	6.84	34.85	1231

TD measurements corrected by 0.28 ft to compensate for distance from needle to end of probe.

1252 Place Abus locks on GMW-14 and GMW-16.

1310 Off-site for lunch

1340 Back on-site

1400 Surged GMW-21 with bailer for 20 minutes and bailed approx. 1 gal from well. until Dry after bailing.

3/2/01 26682 J. Hesseman  

Well #	(°F) temp	pH	(mS) COND	Cond PV Time	Time
GMW-19	61.2	7.5	0.60	4.4	1329
Dry @ 8 gals	61.3	7.3	0.60	8.8	1336

13.2

1340 Collect sample GMW-19. Water was clear and became light brown.

1405 Collect sample GMW-21. Water was clear and became brown.

1420 Drain purge water into 55-gal drum on-site  
 John H. off-site.

~~\_\_\_\_\_~~  


3/6/01 26682 J. Hesseman  
 0850 John H. on site. Weather is clear with light wind, ~ 30°. Unlock all in residential area for surveyors.

Well #	DTW	TD	Time
GMW-1	2.68		0930
GMW-4	5.98		1023
GMW-5	13.98		0938
GMW-6	3.86		0954
GMW-7	5.93		1040
GMW-8	6.54		1046
GMW-9	7.29		1042
GMW-10	8.48		1012
GMW-11	7.43		1010
GMW-14	6.90		1052
GMW-15	4.57		1000
GMW-16	7.17		1048
GMW-17	14.95		0936
GMW-18	14.52		0935

3/2/01 26682 J. Heseemann

1135 Roberts completing GMW-23; GMW-24.

1223 Roberts finished completing wells.

1237 Joey w/ Roberts off-site.

Well #	PV (gal)	temp (°F)	pH	(ms) cond.	Time
GMW-23	5.2	55.4	6.6	0.40	0905
	10.4	56.5	6.7	0.40	0919
	15.6	56.1	7.0	0.40	0932

0940 Collect sample GMW-22. Water was reddish brown and became cloudy.

Well #	PV	(°F) temp	pH	(ms) cond.	Time
GMW-23	5.1	57.8	7.1	0.80	0955
	10.2	58.1	7.5	0.70	1003
	15.3	59.4	7.7	0.70	1009

1012 Collect sample GMW-23. Water was yellowish brown and became clear to cloudy.

Well #	(gal) PV	(°F) temp	pH	(ms) cond.	Time
GMW-24	4.7	58.3	7.9	0.70	1026
	9.4	58.4	7.8	0.60	1044
	14.1	58.6	7.9	0.60	1109

1111 Collect sample GMW-24. Water was reddish brown and became cloudy.

Well #	(gal) PV	(°F) temp	pH	(ms) cond.	Time
GMW-20	3.5	61°	7.3	0.80	1259
Dry E 5.5 gal	7.0	60.7	7.4	0.80	1303
	10.6				

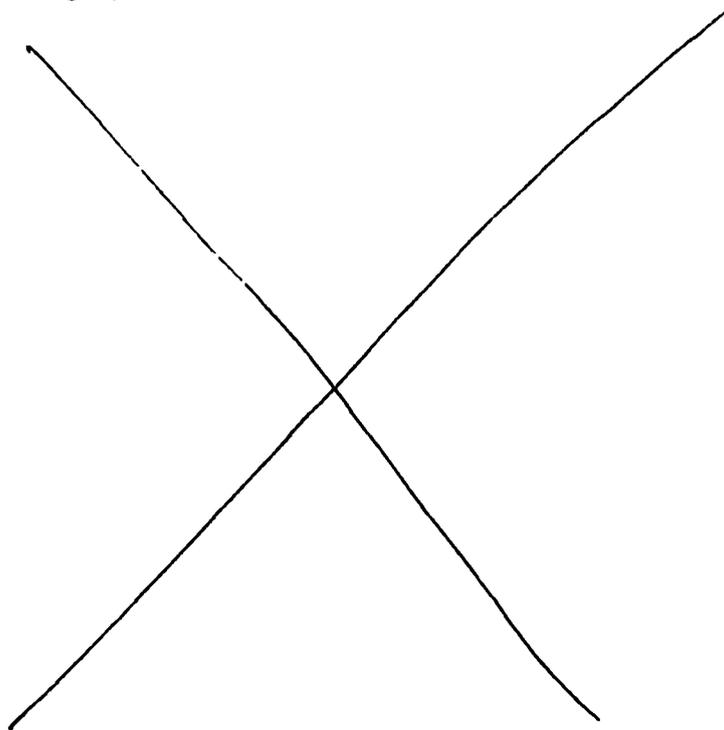
1306 Collect sample GMW-20. Water was clear and became light brown.

~~Well #~~

3/1/01 26682 J. Heseemann

1445 Finished grouting well and cleaning up site. Moving equipment to decon. pad

1510 Roberts setting up to decon. rig and equipment. John H. off-site.



*[Handwritten signature]*

3/2/01 26682 J. Heseemann

0800 John H. on site. Weather is breezy, overcast, ~40°. Joey w/ Roberts on site at GMW-21

<u>Well #</u>	<u>DTW</u>	<u>ID</u>	<u>PV</u>	<u>Time</u>
GMW-21	13.47	33.22	9.9	0830
GMW-22	6.15	37.40	15.6	0857
GMW-23	4.03	34.63	15.3	0949
GMW-24	6.61	34.85	14.1	1019
GMW-19	9.21	35.52	13.2	1317
GMW-20	12.02	33.15	10.6	1245

<u>Well #</u>	<u>(gal) PV</u>	<u>(°F) Temp</u>	<u>pH</u>	<u>(mS) Cond.</u>	<u>Time</u>
GMW-21	3.3	53.8	5.4	1.30	0845
Dry at 6 gals	6.5	7.1	1.00		1354
	9.9				

- Well dry @ 3.3 gal. Will return to continue purging.

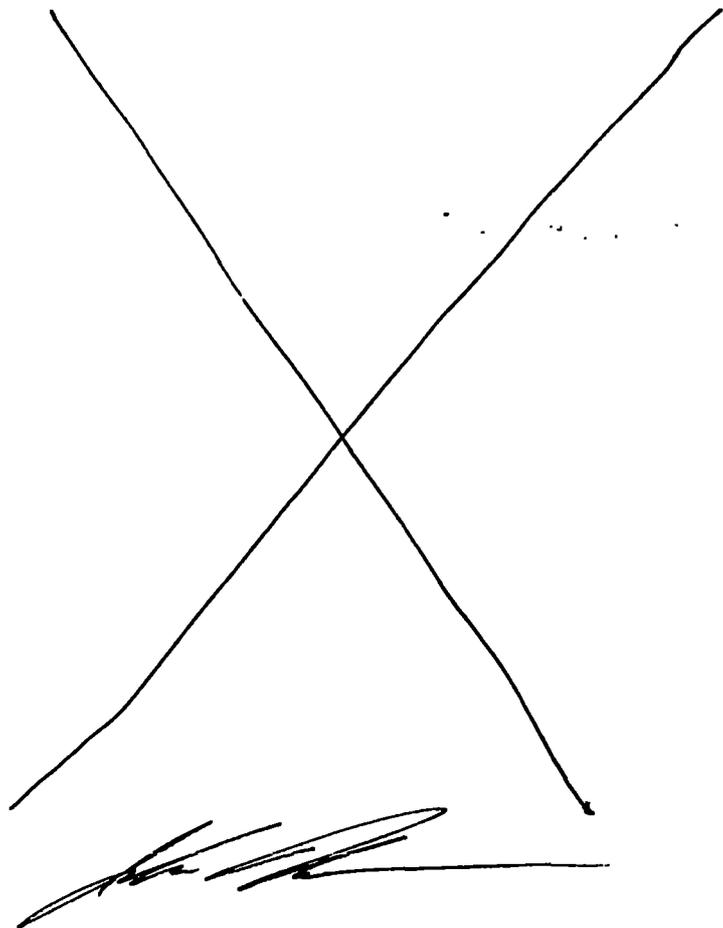
1132 Well is dry again at 3.8 gal. Will return to purge again later.

2/28/01 26682 J. Heseemann

1503 Roberts grouting GMW-23.

1540 Lance Livcsay off-site. Roberts cleaning & up at site.

1555 Roberts preparing to decon. John H. off-site.



3/1/01 26682 J. Heseemann

0825 John H. on-site. Weather is overcast, star calm, ~30°.

Roberts (Joe? Joey) on site.

Moving to 1470 Wiskart to drill GMW-24.

0840 Calibrate PID.

0915 ~~back~~ Tom Zychinski on site.

0930 Lance Livcsay (MDNR) on site.

1030 Complete drilling GMW-24 at 38.5'.

1050 Lance Livcsay (MDNR) off site. Roberts placing bentonite and pulling augers.

1118 Roberts setting well.

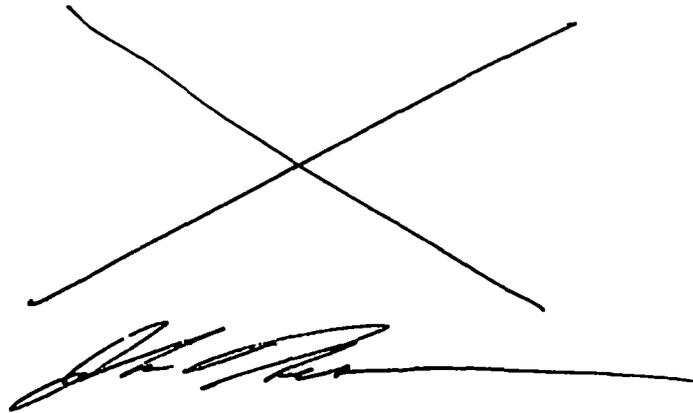
1200 1145 Off-site for lunch break

1325 Back on site.

1340 Tom Z. off-site. Roberts pulling augers and preparing to grout GMW-24.

2/27/01 26682 J. Heesemann  
 1430 Mike with DGLS off-site.  
 Roberts constructing well.  
 1500 John H. checking utilities for  
 next well  
 1530 Roberts has sand and bentonite chips  
 in place. pre Augers are out of  
 hole. Preparing to grout.  
 1615 Grouting complete. Area cleaned  
 up. Moving equipment to decon.  
 pad. Lance Livesay off-site.  
 1630 Roberts setting up to decon.  
 and filling water tank.  
 1640 John H. off-site.

2/28/01 26682 J. Heesemann  
 0820 John H. on-site weather is  
 overcast, calm, ~ 30°.  
 0825 Joe & Joey w/ Roberts on site.  
 Start Completing GMW-22.  
 0835 Lance Livesay (MDNR) on site.  
 0905 Finished completing GMW-22.  
 Moving to 1438 Wishart to drill  
 GMW-23.  
 0920 Calibrate PID  
 0932 Mike Siemens (MO-DGLS) on site.  
 0937 Begin drilling GMW-23.  
 1144 Complete drilling of GMW-23  
 at 38.5 ft.  
 1221 Off-site for lunch break.  
 1315 Back on-site. Roberts will back  
 fill with bentonite chips to 35' lvs.  
 1340 Mike Siemens off-site. Roberts  
 constructing well.  
 1451 Sand and bentonite are in place. Augers  
 are out of hole.



2/26/01 26682 J. Heesemann  
1320 Set 2" PVC well with 5 feet  
of screen.  
1350 set sand filter pack to 29 feet.  
1400 Set bentonite chips to 26 feet.  
1508 ~~Wt~~ Finished grouting well in place.  
Will let grout set over night  
before completing well.  
1518 Cleaning up site.  
1525 Lance Livesay off-site.  
1530 Setting up decon. pad and filling  
water tank.  
1605 Deconing augers.  
1615 John H. off-site.

2/27/01 26682 J. Heesemann  
0755 John H. on-site. Weather ~~is~~ is  
overcast, with light breeze and  
snow, ~30°.  
0805 Calibrate PID. Snow becoming  
heavier and changing to sleet and  
rain.  
0826 Roberts & (Joe & Joey) on site.  
0835 Roberts will complete GMW-21  
first.  
0900 GMW-21 complete. Setting up  
to drill GMW-22.  
0930 Mike Siemens with <sup>NO-</sup>DGLS  
on-site.  
0959 Begin drilling GMW-22  
1230 Off-site ~~to~~ for lunch break.  
1350 Complete GMW-22 at 42 ft.  
Will backfill w/ bentonite chips to  
39 ft.  
1425 Chips are in place. will hydrate in  
groundwater. Mike and Lance agree  
we can construct well without waiting 4 hours.

P

A

T

T  
5  
an

- 2/26/01 26682 J. Heesmann  
0815 John H. on-site. Weather  
is clear, calm, ~35°. Checking  
utilities and property at site  
of first MW to be installed  
(GMW-21) at 1476 Elmridge Pl.  
~~0830~~ Locate sewer, gas, and water  
service line.  
0830 Calibrate P.I.D.  
0850 Joey Brown and Joe Cox of  
Roberts Drilling on-site.  
0910 Begin drilling GMW-21.  
1000 Lance Livesey (MDNR) on site.  
1130 Complete GMW-21 at 40'.  
1150 ~~Be~~ Begin bringing bottom of hole  
up to 35' w/ bentonite chips.  
Water in hole will hydrate.  
1224 Chips are set. Break for  
lunch.  
1315 Back on site. Chips will place  
6 inches of sand on top of  
chips and set well.

**ATTACHMENT 2**

**QA/QC Memorandum  
Laboratory Analytical Results**



Date: March 22, 2001  
To: Tom Zychinski  
From: Christine Rice – Burns & McDonnell  
Re: QA/QC Review of Analytical Data  
Project Number (36682-PKJ)

Groundwater samples were collected from 6 wells on March 2, 2001. The samples were analyzed by Southwest Laboratory of Oklahoma, Inc. of Broken Arrow, Oklahoma for halogenated volatile organic compounds (VOCs) by SW-846 Method 8021B.

The sample results were reviewed for the Level III parameters listed on the attached checklist. The checklist items were examined for any method-specific requirements. Data qualifiers, when appropriate, were added to the data as recommended in *National Functional Guidelines for Organic Data Review* (NFGO, 1999). The quality assurance/quality control (QA/QC) review results are discussed below.

1. Chain-of-Custody – The chain-of-custody (COC) forms were signed by the relinquisher and the receiver.
2. Requested Analyses Completed – All analyses were performed as requested on COCs.
3. Holding Times – All samples were analyzed within the method-required holding times.
4. Sample Preservation – All samples were received at 0.9 degrees Celsius. This was less than the required temperature range of 2 to 6 degrees Celsius. However, because the samples were received by the laboratory in the liquid form, there was no detrimental affect on the samples. No qualifiers were added.
5. Laboratory Method Blanks – The method blanks contained no detections of target analytes.
6. Trip Blanks – Trip Blank TB/GW contained 1,1,2-trichloroethane at 1 µg/L. Because the associated samples did not contain similar detections of 1,1,2-trichloroethane, the samples were unaffected and no qualifiers were added.
7. Surrogates – Surrogates are added for organic analyses. Surrogates are compounds not normally found in the environment that are added (spiked) into samples and analyzed for percent recovery (REC). Maximum and minimum limits on the REC are set by the laboratory for the method used.

All surrogate RECs were within QC limits.

8. Laboratory Control Samples/Laboratory Control Sample Duplicate (LCS/LCSD) – LCS/LCSD contains a matrix similar to that of the sample that has been spiked with



Memorandum  
March 22, 2001  
Page 2

known concentrations of target analytes. The LCS/LCSD is prepared and analyzed by the same method as the samples. As a measure of analytical accuracy, the results of the LCS are compared against the known analyte concentrations in the spike to determine REC. As a measure of precision, the LCS and LCSD results are compared against each other for reproducibility. The purpose of the LCS/LCSD is to determine the performance of the laboratory with respect to analyte recovery, independent of field sample matrix interference.

All LCS/LCSD RECs and relative percent differences (RPDs) were within the QC limits.

9. Matrix Spike/Matrix Spike Duplicates (MS/MSD) – MS/MSDs are typically run for organic analyses. A sample is split into three portions (original, MS and MSD), and a known amount of a target analyte is added (spiked) to two portions (MS and MSD) of the sample. The results of these two portions are compared with each other for reproducibility using the relative percent difference (RPD). They are also compared against the unspiked portion of the sample for REC of the spike.

The VOC MS/MSD was performed on Sample GMW-19/GW. The MS RECs for 1,1,2-trichloroethane (79 percent) and 1,2-dichlorobenzene (81 percent) fell slightly below the QC minimums of 80 and 83 percent, respectively. Because the LCS/LCSD RECs for these analytes were within the QC limits, the problem appears to be limited to the MS/MSD. NFGO does not require qualification of VOC data based solely upon the MS/MSD results. Therefore, no qualifiers were added and the VOC results should be used as reported by the laboratory.

10. Field Duplicate Results – No Field duplicates were required for this sampling event.
11. Detection and Quantitation Limits – The VOC results of Sample GMW-19/GW were diluted by a factor of 500, and the VOC results of Samples GMW-20/GW and GMW-21/GW were diluted by a factor of 50. These dilutions were required to bring target analyte concentrations into the linear range of the instrument calibration and/or to compensate for matrix interference.
12. Conclusion – No qualifiers were added to the data. As such, the results of this review indicate that the data are valid for use in reporting the results of this investigation.

Attachment

# Organic Data Validation Checklist

SDG No.: 45949  
 Project Name: PKI  
 Project No.: 26682-3.20.30

Site: Perkin Elmer  
 Laboratory: Southwest  
 Analysis Type: VOCs by 8021B

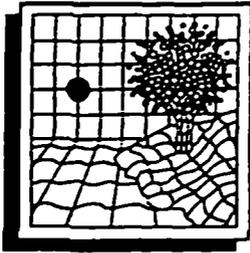
**Instructions:**

1. Initial and date this form at the start and end of review for this SDG.
2. Place a check mark in the "NA" column when the review item was not applicable.
3. When review of a checklist item is complete, place a check mark in the "Reviewed" column.
4. Place an "NS" designation in the "Reviewed" column when applicable data were not supplied.
5. Place a check mark or an "NR" in the "Qualified" column if related data did or did not require qualification, respectively.
6. See "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review," February 1993, for validation purposes.
7. Level IV review is generally performed on 5-10% of all sample results; actual percentage is project specific.
8. Place a check mark in the box at the beginning of the Level IV section if no associated raw data were reviewed.

	NA	Reviewed	Qualified	Comments
<b>Level III Review Item</b>				
Signed Chain-of-Custody Available		X	NR	
Requested Analyses Completed		X	NR	
Holding Times Met		X	NR	
Sample Preservation Acceptable		X	NR	Samples were received at 0.9 degrees Celsius. No detriment to samples. No qualifiers.
Laboratory Method Blank Results		X	NR	
Field Blank Results	X			
Trip Blank Results (VOC only)		X	NR	TB/GW detected 1,1,2-trichloroethane at 1 µg/L. No samples contained similar detection. No qualifiers.
Surrogate Recoveries		X	NR	
Laboratory Control Sample Results		X	NR	
MS/MSD Results		X	NR	On GMW-19/GW. 1,1,2-Trichloroethane MS=79% (80-123%) and 1,2-Dichlorobenzene MS=81% (83-117%). No qualifiers.
Field Duplicates	X			
Quantitation Limits		X	NR	GMW-19/GW DF=500; GMW-20/GW DF=50; GMW-21/GW DF=50
<b>Level IV Review Item = Summary Sheets Only</b>				
GC/MS Tuning				
Initial Calibrations				
Continuing Calibrations				
Internal Standards				
<b>Enhanced Level IV Review Item</b>				
Compound Identification				
Compound Quantitation				

Date Started/  
 Reviewer: 03/22/2001 C. Rice

Date Completed/  
 Reviewer: 03/22/2001 C. Rice



# SOUTHWEST LABORATORY OF OKLAHOMA, INC.

March 15, 2001

Mr. Todd Zychinski  
Burns and McDonnell Waste Consultants  
9400 Ward Parkway  
Kansas City, MO 64114

Project: PKI/26682  
Project No.: 26682  
SWLO ID: 45949.01 - 45949.07

Dear Mr. Zychinski

Enclosed please find the Level II tabular report for the above referenced samples, received in our laboratory on March 3, 2001.

Thank you for choosing Southwest Labs. If in your review you should have any questions or require additional information, do not hesitate to call.

Sincerely,

A handwritten signature in black ink, appearing to read 'Randy Staggs', written over a light-colored background.

Randy Staggs  
Project Officer

RES/jt

Enclosures

"We certify that the following test report meets all required NELAC reporting standards as specified in NELAC 5.13, July 1, 1999. Any deviation or variance is noted in the case narrative(s)."

"Estimated Uncertainties regarding these analyses are presented in the Quality Control Section of this report."

**Request for Chemical Analysis and Chain of Custody Record**

2

Burns & McDonnell Waste Consultants, Inc.  
 9400 Ward Parkway  
 Kansas City, Missouri 64114  
 Phone: (816) 333-8787 Fax: (816) 822-3463

Laboratory Southwest Labs, Inc.  
 Address 1700 West Albany  
 City/State/Zip Broken Arrow, OK 74012  
 Telephone (918) 251-2858

Document Control No.: \_\_\_\_\_  
 Lab. Reference No. or Episode No.: \_\_\_\_\_

Attention: John H. T. Zychinski

Project Number: 26682

Project Name: PKI

Site, Group, or SWMU Name: \_\_\_\_\_

Sample Type

Matrix

Sample Number	Sample Designator	Sample Event		Sample Depth (in feet)		Sample Collected		Liquid	Solid	Gas	Composite	Grab	Number of Containers	Remarks	
		Round	Year	From	To	Date	Time								
GMW-19	GW ↓					3/26/01	1340	X				X	2 Analysis Requested 8/21/01	0.90	
GMW-20							1306								
GMW-21								1405							
GMW-22								0940							
GMW-23								1012							
GMW-24								1111	X						X
TB															

Sampler (signature) [Signature]

Sampler (signature) \_\_\_\_\_

Relinquished By: \_\_\_\_\_

1. \_\_\_\_\_

Relinquished By: \_\_\_\_\_

2. \_\_\_\_\_

Date/Time 3/26/01

Date/Time \_\_\_\_\_

Received By: \_\_\_\_\_

Received By: [Signature]

Received By: \_\_\_\_\_

Date/Time \_\_\_\_\_

Date/Time 3/26/01 9:20

Date/Time \_\_\_\_\_

Special Instructions: \_\_\_\_\_

Condition of Shipping Container:

Good  Fair  Poor

Comments: \_\_\_\_\_

Ice Present in Container:

Yes  No



SOUTHWEST LABORATORY OF OKLAHOMA  
1700 West Albany, Suite A / Broken Arrow, OK 74012  
918-251-2858

SDG NARRATIVE

March 15, 2001

CLIENT: B&MC

SDG No.: 45949

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VOLATILE FRACTION

Seven water samples plus an MS/MSD were submitted for Volatile Organic Analysis. The samples were analyzed by GC based on Method 8021B for the halogenated compounds.

No major problems occurred during the analyses of these samples. Second column confirmation performed upon client request. GWM-19 GW, GWM-20 GW and GWM-21 GW required dilution due to the high levels of target compounds.

Blanks: No problems.

Surrogates: No problems.

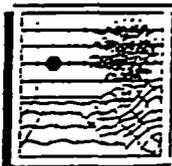
Laboratory Control Spikes: No problems

Matrix Spikes: 1,1,2-Trichloroethene and 1,2 dichlorobenzene recoveries were low in the MS. As all other QC were acceptable and neither of these compounds were detected in the samples no action was taken.



James G. Whittaker  
Volatile Section Supervisor

March 15, 2001



# SWLO Qualifier Flags

GENERAL  
ADMINISTRATIVE

## METHODOLOGY

- SM = Standard Methods, 18<sup>th</sup> Edition, 1992
- EPA = EPA600 / 4-79-020, March 1985
- SW = EPA Methodology, "#SW846", Final Update III, June, 1997

## GENERAL QUALIFIER FLAGS

- B = Analyte is detected in blank as well as sample
- J = Estimated value: concentration is below limit of quantitation
- T = Trace amount
- U = Not detected
- > = Concentration greater than value reported
- E = Compound exceeds calibration range
- D = Sample dilution run or surrogates diluted out  
Sample run at secondary dilution
- I = Not quantifiable due to matrix interference
- \* = Surrogate outside of QC limits on both original and re-analysis
- P = Pesticide Aroclor Flag used when >25% difference between two GC columns. The lower of the two values is reported.

## TPH 8015

- 1 = Analysis shows miscellaneous peaks, which cannot be identified as any specific pattern. Response factor for nearest eluting hydrocarbon standard was used to calculate concentration.
- 2 = Pattern is similar to, but not identical to standard.
- 3 = May be a weathered gasoline.

## APPENDIX IX SEMIVOLATILES

- 1 = Detected as Diphenylamine
- 2 = Coelute on GC Column

## TCLP SEMIVOLATILES

- 1 = 1-methyl phenol
- 2 = Compounds Co-elute (3 & 4-methylphenol)
- 3 = Combination of O, M, & P Cresols

## DIOXINS

- X = EMPC (Estimated Maximum Possible Concentration)
- I\* = EMPC - ether interference

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/29/01

DATA FILE: X7062.D

SAMPLE ID: GWM-19 GW

SAMPLE MATRIX: WATER

SWOK ID: 45949.01

METHOD REFERENCE: 8021

DATE RECEIVED: 03/03/01

PROJECT:

DATE ANALYZED: 03/14/01

DILUTION: 500

BLANK ID: X010314A

RESULTS REPORTED IN ug/L OR PARTS PER BILLION (PPB)

PARAMETER	QUANTITATION LIMIT	RESULTS	Q
CHLOROMETHANE	500	500	U
VINYL CHLORIDE	500	500	U
BROMOMETHANE	500	500	U
CHLOROETHANE	500	500	U
TRICHLOROFLUOROMETHANE	500	500	U
1,1-DICHLOROETHENE	500	500	U
METHYLENE CHLORIDE	500	500	U
trans-1,2-DICHLOROETHENE	500	500	U
1,1-DICHLOROETHANE	500	500	U
cis-1,2-DICHLOROETHENE	500	1200	U
CHLOROFORM	500	500	U
1,1,1-TRICHLOROETHANE	500	500	U
CARBON TETRACHLORIDE	500	500	U
1,2-DICHLOROETHANE	500	500	U
TRICHLOROETHENE	500	4300	U
1,2-DICHLOROPROPANE	500	500	U
BROMODICHLOROMETHANE	500	500	U
2-CHLOROETHYL VINYL ETHER	500	500	U
cis-1,3-DICHLOROPROPENE	500	500	U
trans-1,3-DICHLOROPROPENE	500	500	U
1,1,2-TRICHLOROETHANE	500	500	U
TETRACHLOROETHENE	500	260	J
DIBROMOCHLOROMETHANE	500	500	U
1,2-DIBROMOETHANE	500	500	U
CHLOROBENZENE	500	500	U
BROMOFORM	500	500	U
1,1,2,2-TETRACHLOROETHANE	500	500	U
1,3-DICHLOROBENZENE	500	500	U
1,4-DICHLOROBENZENE	500	500	U
1,2-DICHLOROBENZENE	500	500	U

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/29/01

DATA FILE: X7062.D

SAMPLE ID: GWM-19 GW

SAMPLE MATRIX: WATER

SWOK ID: 45949.01

METHOD REFERENCE: 8021

DATE RECEIVED: 03/03/01

PROJECT:

DATE ANALYZED: 03/14/01

DILUTION: 500

BLANK ID: X010314A

QA/QC SURROGATE RECOVERIES

=====

2-BROMO-1-CHLOROPROPANE	(72-119)	77%
2-BROMOCHLOROBENZENE	(71-123)	82%

U = NOT DETECTED

\* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS, FAILED TWICE

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/29/01

DATA FILE: X7052.D

SAMPLE ID: GWM-20 GW  
 SWOK ID: 45949.02  
 DATE RECEIVED: 03/03/01  
 DATE ANALYZED: 03/14/01  
 BLANK ID: X010313A

SAMPLE MATRIX: WATER  
 METHOD REFERENCE: 8021  
 PROJECT:  
 DILUTION: 50

RESULTS REPORTED IN ug/L OR PARTS PER BILLION (PPB)

PARAMETER	QUANTITATION LIMIT	RESULTS	Q
CHLOROMETHANE	50	50	U
VINYL CHLORIDE	50	50	U
BROMOMETHANE	50	50	U
CHLOROETHANE	50	50	U
TRICHLOROFLUOROMETHANE	50	50	U
1,1-DICHLOROETHENE	50	50	U
METHYLENE CHLORIDE	50	50	U
trans-1,2-DICHLOROETHENE	50	50	U
1,1-DICHLOROETHANE	50	50	U
cis-1,2-DICHLOROETHENE	50	400	U
CHLOROFORM	50	50	U
1,1,1-TRICHLOROETHANE	50	50	U
CARBON TETRACHLORIDE	50	50	U
1,2-DICHLOROETHANE	50	50	U
TRICHLOROETHENE	50	1700	U
1,2-DICHLOROPROPANE	50	50	U
BROMODICHLOROMETHANE	50	50	U
2-CHLOROETHYL VINYL ETHER	50	50	U
cis-1,3-DICHLOROPROPENE	50	50	U
trans-1,3-DICHLOROPROPENE	50	50	U
1,1,2-TRICHLOROETHANE	50	50	U
TETRACHLOROETHENE	50	50	U
DIBROMOCHLOROMETHANE	50	50	U
1,2-DIBROMOETHANE	50	50	U
CHLOROBENZENE	50	50	U
BROMOFORM	50	50	U
1,1,2,2-TETRACHLOROETHANE	50	50	U
1,3-DICHLOROBENZENE	50	50	U
1,4-DICHLOROBENZENE	50	50	U
1,2-DICHLOROBENZENE	50	50	U

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/29/01

DATA FILE: X7052.D

SAMPLE ID: GWM-20 GW

SAMPLE MATRIX: WATER

SWOK ID: 45949.02

METHOD REFERENCE: 8021

DATE RECEIVED: 03/03/01

PROJECT:

DATE ANALYZED: 03/14/01

DILUTION: 50

BLANK ID: X010313A

QA/QC SURROGATE RECOVERIES

=====

2-BROMO-1-CHLOROPROPANE	(72-119)	77%
2-BROMOCHLOROBENZENE	(71-123)	80%

U = NOT DETECTED

\* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS, FAILED TWICE

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/29/01

DATA FILE: X7053.D

SAMPLE ID: GWM-21 GW

SAMPLE MATRIX: WATER

SWOK ID: 45949.03

METHOD REFERENCE: 8021

DATE RECEIVED: 03/03/01

PROJECT:

DATE ANALYZED: 03/14/01

DILUTION: 50

BLANK ID: X010313A

RESULTS REPORTED IN ug/L OR PARTS PER BILLION (PPB)

PARAMETER	QUANTITATION LIMIT	RESULTS	Q
CHLOROMETHANE	50	50	U
VINYL CHLORIDE	50	50	U
BROMOMETHANE	50	50	U
CHLOROETHANE	50	50	U
TRICHLOROFLUOROMETHANE	50	50	U
1,1-DICHLOROETHENE	50	50	U
METHYLENE CHLORIDE	50	37	J
trans-1,2-DICHLOROETHENE	50	50	U
1,1-DICHLOROETHANE	50	50	U
cis-1,2-DICHLOROETHENE	50	50	U
CHLOROFORM	50	50	U
1,1,1-TRICHLOROETHANE	50	50	U
CARBON TETRACHLORIDE	50	50	U
1,2-DICHLOROETHANE	50	50	U
TRICHLOROETHENE	50	360	
1,2-DICHLOROPROPANE	50	50	U
BROMODICHLOROMETHANE	50	50	U
2-CHLOROETHYL VINYL ETHER	50	50	U
cis-1,3-DICHLOROPROPENE	50	50	U
trans-1,3-DICHLOROPROPENE	50	50	U
1,1,2-TRICHLOROETHANE	50	50	U
TETRACHLOROETHENE	50	170	
DIBROMOCHLOROMETHANE	50	50	U
1,2-DIBROMOETHANE	50	50	U
CHLOROBENZENE	50	50	U
BROMOFORM	50	50	U
1,1,2,2-TETRACHLOROETHANE	50	50	U
1,3-DICHLOROBENZENE	50	50	U
1,4-DICHLOROBENZENE	50	50	U
1,2-DICHLOROBENZENE	50	50	U

10

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/29/01

DATA FILE: X7053.D

SAMPLE ID: GWM-21 GW

SAMPLE MATRIX: WATER

SWOK ID: 45949.03

METHOD REFERENCE: 8021

DATE RECEIVED: 03/03/01

PROJECT:

DATE ANALYZED: 03/14/01

DILUTION: 50

BLANK ID: X010313A

QA/QC SURROGATE RECOVERIES

=====

2-BROMO-1-CHLOROPROPANE	(72-119)	72%
2-BROMOCHLOROBENZENE	(71-123)	79%

U = NOT DETECTED

\* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS, FAILED TWICE

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/29/01

DATA FILE: X7048.D

SAMPLE ID: GWM-22 GW

SAMPLE MATRIX: WATER

SWOK ID: 45949.04

METHOD REFERENCE: 8021

DATE RECEIVED: 03/03/01

PROJECT:

DATE ANALYZED: 03/13/01

DILUTION: 1

BLANK ID: X010313A

RESULTS REPORTED IN ug/L OR PARTS PER BILLION (PPB)

PARAMETER	QUANTITATION LIMIT	RESULTS	Q
CHLOROMETHANE	1	1	U
VINYL CHLORIDE	1	1	U
BROMOMETHANE	1	1	U
CHLOROETHANE	1	1	U
TRICHLOROFLUOROMETHANE	1	1	U
1,1-DICHLOROETHENE	1	1	U
METHYLENE CHLORIDE	1	1	U
trans-1,2-DICHLOROETHENE	1	1	U
1,1-DICHLOROETHANE	1	1	U
cis-1,2-DICHLOROETHENE	1	1	U
CHLOROFORM	1	1	U
1,1,1-TRICHLOROETHANE	1	1	U
CARBON TETRACHLORIDE	1	1	U
1,2-DICHLOROETHANE	1	1	U
TRICHLOROETHENE	1	6	U
1,2-DICHLOROPROPANE	1	1	U
BROMODICHLOROMETHANE	1	1	U
2-CHLOROETHYL VINYL ETHER	1	1	U
cis-1,3-DICHLOROPROPENE	1	1	U
trans-1,3-DICHLOROPROPENE	1	1	U
1,1,2-TRICHLOROETHANE	1	1	U
TETRACHLOROETHENE	1	2	U
DIBROMOCHLOROMETHANE	1	1	U
1,2-DIBROMOETHANE	1	1	U
CHLOROBENZENE	1	1	U
BROMOFORM	1	1	U
1,1,2,2-TETRACHLOROETHANE	1	1	U
1,3-DICHLOROBENZENE	1	1	U
1,4-DICHLOROBENZENE	1	1	U
1,2-DICHLOROBENZENE	1	1	U

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/29/01

DATA FILE: X7048.D

SAMPLE ID: GWM-22 GW

SAMPLE MATRIX: WATER

SWOK ID: 45949.04

METHOD REFERENCE: 8021

DATE RECEIVED: 03/03/01

PROJECT:

DATE ANALYZED: 03/13/01

DILUTION: 1

BLANK ID: X010313A

QA/QC SURROGATE RECOVERIES

=====

2-BROMO-1-CHLOROPROPANE	(72-119)	79%
2-BROMOCHLOROBENZENE	(71-123)	83%

U = NOT DETECTED

\* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS, FAILED TWICE

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/29/01

DATA FILE: X7049.D

SAMPLE ID: GWM-23 GW  
SWOK ID: 45949.05  
DATE RECEIVED: 03/03/01  
DATE ANALYZED: 03/13/01  
BLANK ID: X010313A

SAMPLE MATRIX: WATER  
METHOD REFERENCE: 8021  
PROJECT:  
DILUTION: 1

RESULTS REPORTED IN ug/L OR PARTS PER BILLION (PPB)

PARAMETER	QUANTITATION LIMIT	RESULTS	Q
CHLOROMETHANE	1	1	U
VINYL CHLORIDE	1	1	U
BROMOMETHANE	1	1	U
CHLOROETHANE	1	1	U
TRICHLOROFLUOROMETHANE	1	1	U
1,1-DICHLOROETHENE	1	1	U
METHYLENE CHLORIDE	1	0.6	J
trans-1,2-DICHLOROETHENE	1	1	U
1,1-DICHLOROETHANE	1	1	U
cis-1,2-DICHLOROETHENE	1	0.8	J
CHLOROFORM	1	1	U
1,1,1-TRICHLOROETHANE	1	1	U
CARBON TETRACHLORIDE	1	1	U
1,2-DICHLOROETHANE	1	1	U
TRICHLOROETHENE	1	26	U
1,2-DICHLOROPROPANE	1	1	U
BROMODICHLOROMETHANE	1	1	U
2-CHLOROETHYL VINYL ETHER	1	1	U
cis-1,3-DICHLOROPROPENE	1	1	U
trans-1,3-DICHLOROPROPENE	1	1	U
1,1,2-TRICHLOROETHANE	1	1	U
TETRACHLOROETHENE	1	8	U
DIBROMOCHLOROMETHANE	1	1	U
1,2-DIBROMOETHANE	1	1	U
CHLOROBENZENE	1	1	U
BROMOFORM	1	1	U
1,1,2,2-TETRACHLOROETHANE	1	1	U
1,3-DICHLOROBENZENE	1	1	U
1,4-DICHLOROBENZENE	1	1	U
1,2-DICHLOROBENZENE	1	1	U

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/29/01

DATA FILE: X7049.D

SAMPLE ID: GWM-23 GW

SAMPLE MATRIX: WATER

SWOK ID: 45949.05

METHOD REFERENCE: 8021

DATE RECEIVED: 03/03/01

PROJECT:

DATE ANALYZED: 03/13/01

DILUTION: 1

BLANK ID: X010313A

QA/QC SURROGATE RECOVERIES

=====

2-BROMO-1-CHLOROPROPANE	(72-119)	79%
2-BROMOCHLOROBENZENE	(71-123)	79%

U = NOT DETECTED

\* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS, FAILED TWICE

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/29/01

DATA FILE: X7050.D

SAMPLE ID: GWM-24 GW

SAMPLE MATRIX: WATER

SWOK ID: 45949.06

METHOD REFERENCE: 8021

DATE RECEIVED: 03/03/01

PROJECT:

DATE ANALYZED: 03/13/01

DILUTION: 1

BLANK ID: X010313A

RESULTS REPORTED IN ug/L OR PARTS PER BILLION (PPB)

PARAMETER	QUANTITATION LIMIT	RESULTS	Q
CHLOROMETHANE	1	1	U
VINYL CHLORIDE	1	1	U
BROMOMETHANE	1	1	U
CHLOROETHANE	1	1	U
TRICHLOROFLUOROMETHANE	1	1	U
1,1-DICHLOROETHENE	1	1	U
METHYLENE CHLORIDE	1	1	U
trans-1,2-DICHLOROETHENE	1	1	U
1,1-DICHLOROETHANE	1	1	U
cis-1,2-DICHLOROETHENE	1	2	U
CHLOROFORM	1	1	U
1,1,1-TRICHLOROETHANE	1	1	U
CARBON TETRACHLORIDE	1	1	U
1,2-DICHLOROETHANE	1	1	U
TRICHLOROETHENE	1	17	U
1,2-DICHLOROPROPANE	1	1	U
BROMODICHLOROMETHANE	1	1	U
2-CHLOROETHYL VINYL ETHER	1	1	U
cis-1,3-DICHLOROPROPENE	1	1	U
trans-1,3-DICHLOROPROPENE	1	1	U
1,1,2-TRICHLOROETHANE	1	1	U
TETRACHLOROETHENE	1	4	U
DIBROMOCHLOROMETHANE	1	1	U
1,2-DIBROMOETHANE	1	1	U
CHLOROBENZENE	1	1	U
BROMOFORM	1	1	U
1,1,2,2-TETRACHLOROETHANE	1	1	U
1,3-DICHLOROBENZENE	1	1	U
1,4-DICHLOROBENZENE	1	1	U
1,2-DICHLOROBENZENE	1	1	U

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/29/01

DATA FILE: X7050.D

SAMPLE ID: GWM-24 GW

SAMPLE MATRIX: WATER

SWOK ID: 45949.06

METHOD REFERENCE: 8021

DATE RECEIVED: 03/03/01

PROJECT:

DATE ANALYZED: 03/13/01

DILUTION: 1

BLANK ID: X010313A

QA/QC SURROGATE RECOVERIES

=====

2-BROMO-1-CHLOROPROPANE	(72-119)	82%
2-BROMOCHLOROBENZENE	(71-123)	79%

U = NOT DETECTED

\* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS, FAILED TWICE

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/29/01

DATA FILE: X7047.D

SAMPLE ID: TB GW  
SWOK ID: 45949.07  
DATE RECEIVED: 03/03/01  
DATE ANALYZED: 03/13/01  
BLANK ID: X010313A

SAMPLE MATRIX: WATER  
METHOD REFERENCE: 8021  
PROJECT:  
DILUTION: 1

RESULTS REPORTED IN ug/L OR PARTS PER BILLION (PPB)

PARAMETER	QUANTITATION LIMIT	RESULTS	Q
CHLOROMETHANE	1	1	U
VINYL CHLORIDE	1	1	U
BROMOMETHANE	1	1	U
CHLOROETHANE	1	1	U
TRICHLOROFLUOROMETHANE	1	1	U
1,1-DICHLOROETHENE	1	1	U
METHYLENE CHLORIDE	1	1	U
trans-1,2-DICHLOROETHENE	1	1	U
1,1-DICHLOROETHANE	1	1	U
cis-1,2-DICHLOROETHENE	1	1	U
CHLOROFORM	1	1	U
1,1,1-TRICHLOROETHANE	1	1	U
CARBON TETRACHLORIDE	1	1	U
1,2-DICHLOROETHANE	1	1	U
TRICHLOROETHENE	1	1	U
1,2-DICHLOROPROPANE	1	1	U
BROMODICHLOROMETHANE	1	1	U
2-CHLOROETHYL VINYL ETHER	1	1	U
cis-1,3-DICHLOROPROPENE	1	1	U
trans-1,3-DICHLOROPROPENE	1	1	U
1,1,2-TRICHLOROETHANE	1	1	U
TETRACHLOROETHENE	1	1	U
DIBROMOCHLOROMETHANE	1	1	U
1,2-DIBROMOETHANE	1	1	U
CHLOROBENZENE	1	1	U
BROMOFORM	1	1	U
1,1,2,2-TETRACHLOROETHANE	1	1	U
1,3-DICHLOROBENZENE	1	1	U
1,4-DICHLOROBENZENE	1	1	U
1,2-DICHLOROBENZENE	1	1	U

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/29/01

DATA FILE: X7047.D

SAMPLE ID: TB GW  
SWOK ID: 45949.07  
DATE RECEIVED: 03/03/01  
DATE ANALYZED: 03/13/01  
BLANK ID: X010313A

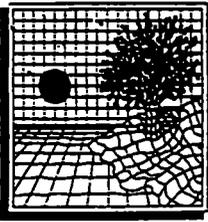
SAMPLE MATRIX: WATER  
METHOD REFERENCE: 8021  
PROJECT:  
DILUTION: 1

QA/QC SURROGATE RECOVERIES  
=====

2-BROMO-1-CHLOROPROPANE	(72-119)	77%
2-BROMOCHLOROBENZENE	(71-123)	80%

U = NOT DETECTED

\* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS, FAILED TWICE



**SOUTHWEST LABORATORY OF OKLAHOMA, INC.**

1700 West Albany • Broken Arrow, Oklahoma 74012 • Office (918) 251-2858 • Fax (918) 251-2596

# QUALITY CONTROL SECTION

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/13/01

DATA FILE: X7040.D

SAMPLE ID: X010313A

SAMPLE MATRIX: WATER

SWOK ID: X010313A

METHOD REFERENCE: 8021

DATE RECEIVED:

PROJECT:

DATE ANALYZED: 03/13/01

DILUTION: 1

RESULTS REPORTED IN ug/L OR PARTS PER BILLION (PPB)

PARAMETER	QUANTITATION LIMIT	RESULTS	Q
CHLOROMETHANE	1	1	U
VINYL CHLORIDE	1	1	U
BROMOMETHANE	1	1	U
CHLOROETHANE	1	1	U
TRICHLOROFLUOROMETHANE	1	1	U
1,1-DICHLOROETHENE	1	1	U
METHYLENE CHLORIDE	1	1	U
trans-1,2-DICHLOROETHENE	1	1	U
1,1-DICHLOROETHANE	1	1	U
cis-1,2-DICHLOROETHENE	1	1	U
CHLOROFORM	1	1	U
1,1,1-TRICHLOROETHANE	1	1	U
CARBON TETRACHLORIDE	1	1	U
1,2-DICHLOROETHANE	1	1	U
TRICHLOROETHENE	1	1	U
1,2-DICHLOROPROPANE	1	1	U
BROMODICHLOROMETHANE	1	1	U
2-CHLOROETHYL VINYL ETHER	1	1	U
cis-1,3-DICHLOROPROPENE	1	1	U
trans-1,3-DICHLOROPROPENE	1	1	U
1,1,2-TRICHLOROETHANE	1	1	U
TETRACHLOROETHENE	1	1	U
DIBROMOCHLOROMETHANE	1	1	U
1,2-DIBROMOETHANE	1	1	U
CHLOROBENZENE	1	1	U
BROMOFORM	1	1	U
1,1,2,2-TETRACHLOROETHANE	1	1	U
1,3-DICHLOROBENZENE	1	1	U
1,4-DICHLOROBENZENE	1	1	U
1,2-DICHLOROBENZENE	1	1	U

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/13/01 DATA FILE: X7040.D  
SAMPLE ID: X010313A SAMPLE MATRIX: WATER  
SWOK ID: X010313A METHOD REFERENCE: 8021  
DATE RECEIVED: PROJECT:  
DATE ANALYZED: 03/13/01 DILUTION: 1

QA/QC SURROGATE RECOVERIES  
=====

2-BROMO-1-CHLOROPROPANE	(72-119)	78%
2-BROMOCHLOROBENZENE	(71-123)	85%

U = NOT DETECTED

\* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS, FAILED TWICE

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/13/01

LCS FILE ID: X7041.D  
SAMPLE MATRIX: WATER  
DATE ANALYZED: 03/13/01

LCS FILE ID: X7042.D  
METHOD REFERENCE: 8021  
PROJECT:

LABORATORY CONTROL SPIKE/SPIKE DUPLICATE RECOVERY

PARAMETER	SPIKE ADDED ug/L	LCS % REC.	LCS % REC.	RPD	QC LIMITS	
					RPD	RECOVERY
CHLOROMETHANE	20	96	96	1	13	50-133
VINYL CHLORIDE	20	96	94	1	14	60-126
BROMOMETHANE	20	105	108	2	16	59-117
CHLOROETHANE	20	96	96	1	17	65-128
TRICHLOROFLUOROMETHANE	20	98	98	1	22	66-133
1,1-DICHLOROETHENE	20	98	97	1	17	78-128
METHYLENE CHLORIDE	20	86	86	1	12	70-128
trans-1,2-DICHLOROETHENE	20	98	97	1	13	77-123
1,1-DICHLOROETHANE	20	98	95	4	12	77-125
cis-1,2-DICHLOROETHENE	20	98	96	2	15	75-123
CHLOROFORM	20	96	96	1	13	71-123
1,1,1-TRICHLOROETHANE	20	98	94	3	13	77-125
CARBON TETRACHLORIDE	20	96	93	4	16	76-124
1,2-DICHLOROETHANE	20	100	100	1	13	75-127
TRICHLOROETHENE	20	94	92	2	13	76-124
1,2-DICHLOROPROPANE	20	104	100	4	12	75-121
BROMODICHLOROMETHANE	20	94	94	1	13	75-121
2-CHLOROETHYL VINYL ETHER	20	104	116	10	35	71-131
cis-1,3-DICHLOROPROPENE	20	102	100	3	15	77-124
trans-1,3-DICHLOROPROPENE	20	108	106	2	15	75-123
1,1,2-TRICHLOROETHANE	20	94	94	1	16	78-127
TETRACHLOROETHENE	20	88	86	2	11	80-121
DIBROMOCHLOROMETHANE	20	106	106	0	15	73-123
1,2-DIBROMOETHANE	20	112	110	1	15	75-125
CHLOROBENZENE	20	96	94	2	13	80-124
BROMOFORM	20	98	95	3	15	70-123
1,1,2,2-TETRACHLOROETHANE	20	95	93	2	16	71-129
1,3-DICHLOROBENZENE	20	90	89	2	14	78-123
1,4-DICHLOROBENZENE	20	89	87	2	17	79-123
1,2-DICHLOROBENZENE	20	88	86	2	14	78-125

\* = VALUE OUTSIDE OF QC LIMITS

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/13/01

DATA FILE: X7041.D

SAMPLE ID: LCS |  
SWOK ID: LCS (8-032-5)  
DATE RECEIVED:  
DATE ANALYZED: 03/13/01  
BLANK ID: X010313A

SAMPLE MATRIX: WATER  
METHOD REFERENCE: 8021  
PROJECT:  
DILUTION: 1

RESULTS REPORTED IN ug/L OR PARTS PER BILLION (PPB)

PARAMETER	QUANTITATION LIMIT	RESULTS	Q
CHLOROMETHANE	1	19	
VINYL CHLORIDE	1	19	
BROMOMETHANE	1	21	
CHLOROETHANE	1	19	
TRICHLOROFLUOROMETHANE	1	20	
1,1-DICHLOROETHENE	1	20	
METHYLENE CHLORIDE	1	17	
trans-1,2-DICHLOROETHENE	1	20	
1,1-DICHLOROETHANE	1	20	
cis-1,2-DICHLOROETHENE	1	20	
CHLOROFORM	1	19	
1,1,1-TRICHLOROETHANE	1	20	
CARBON TETRACHLORIDE	1	19	
1,2-DICHLOROETHANE	1	20	
TRICHLOROETHENE	1	19	
1,2-DICHLOROPROPANE	1	21	
BROMODICHLOROMETHANE	1	19	
2-CHLOROETHYL VINYL ETHER	1	21	
cis-1,3-DICHLOROPROPENE	1	20	
trans-1,3-DICHLOROPROPENE	1	22	
1,1,2-TRICHLOROETHANE	1	19	
TETRACHLOROETHENE	1	18	
DIBROMOCHLOROMETHANE	1	21	
1,2-DIBROMOETHANE	1	22	
CHLOROENZENE	1	19	
BROMOFORM	1	20	
1,1,2,2-TETRACHLOROETHANE	1	19	
1,3-DICHLOROENZENE	1	18	
1,4-DICHLOROENZENE	1	18	
1,2-DICHLOROENZENE	1	18	

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/13/01

DATA FILE: X7041.D

SAMPLE ID: LCS |  
SWOK ID: LCS (8-032-5)  
DATE RECEIVED:  
DATE ANALYZED: 03/13/01  
BLANK ID: X010313A

SAMPLE MATRIX: WATER  
METHOD REFERENCE: 8021  
PROJECT:  
DILUTION: 1

QA/QC SURROGATE RECOVERIES

2-BROMO-1-CHLOROPROPANE	(72-119)	95%
2-BROMOCHLOROBENZENE	(71-123)	94%

U = NOT DETECTED

\* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS, FAILED TWICE

Page 2 of 2

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/13/01

DATA FILE: X7042.D

SAMPLE ID: LCSD |  
SWOK ID: LCSD (8-032-5)  
DATE RECEIVED:  
DATE ANALYZED: 03/13/01  
BLANK ID: X010313A

SAMPLE MATRIX: WATER  
METHOD REFERENCE: 8021  
PROJECT:  
DILUTION: 1

RESULTS REPORTED IN ug/L OR PARTS PER BILLION (PPB)

PARAMETER	QUANTITATION LIMIT	RESULTS	Q
CHLOROMETHANE	1	19	
VINYL CHLORIDE	1	19	
BROMOMETHANE	1	22	
CHLOROETHANE	1	19	
TRICHLOROFLUOROMETHANE	1	20	
1,1-DICHLOROETHENE	1	19	
METHYLENE CHLORIDE	1	17	
trans-1,2-DICHLOROETHENE	1	19	
1,1-DICHLOROETHANE	1	19	
cis-1,2-DICHLOROETHENE	1	19	
CHLOROFORM	1	19	
1,1,1-TRICHLOROETHANE	1	19	
CARBON TETRACHLORIDE	1	19	
1,2-DICHLOROETHANE	1	20	
TRICHLOROETHENE	1	18	
1,2-DICHLOROPROPANE	1	20	
BROMODICHLOROMETHANE	1	19	
2-CHLOROETHYL VINYL ETHER	1	23	
cis-1,3-DICHLOROPROPENE	1	20	
trans-1,3-DICHLOROPROPENE	1	21	
1,1,2-TRICHLOROETHANE	1	19	
TETRACHLOROETHENE	1	17	
DIBROMOCHLOROMETHANE	1	21	
1,2-DIBROMOETHANE	1	22	
CHLOROENZENE	1	19	
BROMOFORM	1	19	
1,1,2,2-TETRACHLOROETHANE	1	19	
1,3-DICHLOROENZENE	1	18	
1,4-DICHLOROENZENE	1	17	
1,2-DICHLOROENZENE	1	17	

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/13/01

DATA FILE: X7042.D

SAMPLE ID: LCSD |  
SWOK ID: LCSD (8-032-5)  
DATE RECEIVED:  
DATE ANALYZED: 03/13/01  
BLANK ID: X010313A

SAMPLE MATRIX: WATER  
METHOD REFERENCE: 8021  
PROJECT:  
DILUTION: 1

QA/QC SURROGATE RECOVERIES

2-BROMO-1-CHLOROPROPANE	(72-119)	97%
2-BROMOCHLOROBENZENE	(71-123)	94%

U = NOT DETECTED

\* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS, FAILED TWICE

Page 2 of 2

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/14/01

DATA FILE: X7058.D

SAMPLE ID: X010314A

SAMPLE MATRIX: WATER

SWOK ID: X010314A

METHOD REFERENCE: 8021

DATE RECEIVED:

PROJECT:

DATE ANALYZED: 03/14/01

DILUTION: 1

RESULTS REPORTED IN ug/L OR PARTS PER BILLION (PPB)

PARAMETER	QUANTITATION LIMIT	RESULTS	Q
CHLOROMETHANE	1	1	U
VINYL CHLORIDE	1	1	U
BROMOMETHANE	1	1	U
CHLOROETHANE	1	1	U
TRICHLOROFLUOROMETHANE	1	1	U
1,1-DICHLOROETHENE	1	1	U
METHYLENE CHLORIDE	1	1	U
trans-1,2-DICHLOROETHENE	1	1	U
1,1-DICHLOROETHANE	1	1	U
CHLOROFORM	1	1	U
1,1,1-TRICHLOROETHANE	1	1	U
CARBON TETRACHLORIDE	1	1	U
1,2-DICHLOROETHANE	1	1	U
TRICHLOROETHENE	1	1	U
1,2-DICHLOROPROPANE	1	1	U
BROMODICHLOROMETHANE	1	1	U
2-CHLOROETHYL VINYL ETHER	1	1	U
cis-1,3-DICHLOROPROPENE	1	1	U
trans-1,3-DICHLOROPROPENE	1	1	U
1,1,2-TRICHLOROETHANE	1	1	U
TETRACHLOROETHENE	1	1	U
DIBROMOCHLOROMETHANE	1	1	U
CHLOROBENZENE	1	1	U
BROMOFORM	1	1	U
1,1,2,2-TETRACHLOROETHANE	1	1	U
1,3-DICHLOROBENZENE	1	1	U
1,4-DICHLOROBENZENE	1	1	U
1,2-DICHLOROBENZENE	1	1	U

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/14/01

DATA FILE: X7058.D

SAMPLE ID: X010314A  
SWOK ID: X010314A

SAMPLE MATRIX: WATER  
METHOD REFERENCE: 8021

DATE RECEIVED:  
DATE ANALYZED: 03/14/01

PROJECT:  
DILUTION: 1

QA/QC SURROGATE RECOVERIES

=====

2-BROMO-1-CHLOROPROPANE	(72-119)	86%
2-BROMOCHLOROBENZENE	(71-123)	90%

U = NOT DETECTED

\* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS, FAILED TWICE

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/14/01

LCS FILE ID: X7061.D 2

SAMPLE MATRIX: WATER

DATE ANALYZED: 03/14/01

METHOD REFERENCE: 8021

PROJECT:

LABORATORY CONTROL SPIKE RECOVERY  
=====

PARAMETER	SPIKE ADDED ug/L	LCS % REC.	RECOVERY LIMITS
CHLOROMETHANE	20	111	50-133
VINYL CHLORIDE	20	94	60-126
BROMOMETHANE	20	77	59-117
CHLOROETHANE	20	96	65-128
TRICHLOROFLUOROMETHANE	20	95	66-133
1,1-DICHLOROETHENE	20	92	78-128
METHYLENE CHLORIDE	20	80	70-128
trans-1,2-DICHLOROETHENE	20	90	77-123
1,1-DICHLOROETHANE	20	90	77-125
CHLOROFORM	20	88	71-123
1,1,1-TRICHLOROETHANE	20	90	77-125
CARBON TETRACHLORIDE	20	89	76-124
1,2-DICHLOROETHANE	20	90	75-127
TRICHLOROETHENE	20	86	76-124
1,2-DICHLOROPROPANE	20	94	75-121
BROMODICHLOROMETHANE	20	104	75-121
2-CHLOROETHYL VINYL ETHER	20	84	71-131
cis-1,3-DICHLOROPROPENE	20	98	77-124
trans-1,3-DICHLOROPROPENE	20	97	75-123
1,1,2-TRICHLOROETHANE	20	80	78-127
TETRACHLOROETHENE	20	86	80-121
DIBROMOCHLOROMETHANE	20	93	73-123
CHLOROBENZENE	20	88	80-124
BROMOFORM	20	81	70-123
1,1,2,2-TETRACHLOROETHANE	20	82	71-129
1,3-DICHLOROBENZENE	20	84	78-123
1,4-DICHLOROBENZENE	20	86	79-123
1,2-DICHLOROBENZENE	20	84	78-125

\* = VALUE OUTSIDE OF QC LIMITS

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/14/01

DATA FILE: X7061.D

SAMPLE ID: LCS <sup>2</sup>  
 SWOK ID: LCS (8-032-5)  
 DATE RECEIVED:  
 DATE ANALYZED: 03/14/01  
 BLANK ID: X010314A

SAMPLE MATRIX: WATER  
 METHOD REFERENCE: 8021  
 PROJECT:  
 DILUTION: 1

RESULTS REPORTED IN ug/L OR PARTS PER BILLION (PPB)

PARAMETER	QUANTITATION LIMIT	RESULTS	Q
CHLOROMETHANE	1	22	
VINYL CHLORIDE	1	19	
BROMOMETHANE	1	15	
CHLOROETHANE	1	19	
TRICHLOROFLUOROMETHANE	1	19	
1,1-DICHLOROETHENE	1	18	
METHYLENE CHLORIDE	1	16	
trans-1,2-DICHLOROETHENE	1	18	
1,1-DICHLOROETHANE	1	18	
CHLOROFORM	1	18	
1,1,1-TRICHLOROETHANE	1	18	
CARBON TETRACHLORIDE	1	18	
1,2-DICHLOROETHANE	1	18	
TRICHLOROETHENE	1	17	
1,2-DICHLOROPROPANE	1	19	
BROMODICHLOROMETHANE	1	21	
2-CHLOROETHYL VINYL ETHER	1	17	
cis-1,3-DICHLOROPROPENE	1	20	
trans-1,3-DICHLOROPROPENE	1	19	
1,1,2-TRICHLOROETHANE	1	16	
TETRACHLOROETHENE	1	17	
DIBROMOCHLOROMETHANE	1	19	
CHLOROBENZENE	1	18	
BROMOFORM	1	16	
1,1,2,2-TETRACHLOROETHANE	1	16	
1,3-DICHLOROBENZENE	1	17	
1,4-DICHLOROBENZENE	1	17	
1,2-DICHLOROBENZENE	1	17	

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/14/01 DATA FILE: X7061.D  
SAMPLE ID: LCS 2 SAMPLE MATRIX: WATER  
SWOK ID: LCS (8-032-5) METHOD REFERENCE: 8021  
DATE RECEIVED: PROJECT:  
DATE ANALYZED: 03/14/01 DILUTION: 1  
BLANK ID: X010314A

QA/QC SURROGATE RECOVERIES  
=====

2-BROMO-1-CHLOROPROPANE	(72-119)	89%
2-BROMOCHLOROBENZENE	(71-123)	85%

U = NOT DETECTED

\* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS, FAILED TWICE

Page 2 of 2

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/15/01

CLIENT SAMPLE ID: GWM-19 GW  
MS FILE ID: X7063.D  
SAMPLE MATRIX: WATER  
DATE ANALYZED: 03/14/01

LAB SAMPLE ID: 45949.01  
MSD FILE ID: X7064.D  
METHOD REFERENCE: 8021  
PROJECT: PKI/26682

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY  
=====

PARAMETER	SPIKE ADDED ug/L	SAMPLE CONC. ug/L	MS % REC.	MSD % REC.	RPD	QC LIMITS	
						RPD	RECOVER
CHLOROMETHANE	20	0	92	93	1	16	31-14
VINYL CHLORIDE	20	0	90	90	0	22	51-13
BROMOMETHANE	20	0	95	93	2	20	52-12
CHLOROETHANE	20	0	91	84	8	20	49-14
TRICHLOROFLUOROMETHANE	20	0	92	89	3	23	56-13
1,1-DICHLOROETHENE	20	0	87	88	1	14	74-13
METHYLENE CHLORIDE	20	0	77	80	4	19	63-13
trans-1,2-DICHLOROETHENE	20	0	91	89	2	15	71-12
1,1-DICHLOROETHANE	20	0	91	89	2	13	71-12
CHLOROFORM	20	0	88	90	2	19	75-12
1,1,1-TRICHLOROETHANE	20	0	90	92	3	14	77-12
CARBON TETRACHLORIDE	20	0	86	87	1	22	76-12
1,2-DICHLOROETHANE	20	0	89	93	4	17	77-12
TRICHLOROETHENE	20	8	82	84	1	20	63-14
1,2-DICHLOROPROPANE	20	0	92	96	3	18	79-11
BROMODICHLOROMETHANE	20	0	84	87	3	13	77-11
2-CHLOROETHYL VINYL ETHER	20	0	133	79	52	182	0-15
cis-1,3-DICHLOROPROPENE	20	0	92	94	3	18	77-12
trans-1,3-DICHLOROPROPENE	20	0	94	98	4	20	81-12
1,1,2-TRICHLOROETHANE	20	0	79*	85	7	15	80-12
TETRACHLOROETHENE	20	1	80	83	4	16	73-12
DIBROMOCHLOROMETHANE	20	0	88	93	6	15	78-11
CHLOROBENZENE	20	0	85	87	2	20	82-12
BROMOFORM	20	0	78	82	6	16	74-11
1,1,2,2-TETRACHLOROETHANE	20	0	81	87	7	24	51-14
1,3-DICHLOROBENZENE	20	0	83	86	3	19	82-12
1,4-DICHLOROBENZENE	20	0	83	89	7	19	78-12
1,2-DICHLOROBENZENE	20	0	81*	85	4	16	83-11

\* = VALUE OUTSIDE OF QC LIMITS

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/15/01

DATA FILE: X7063.D

SAMPLE ID: GWM-19 GWMS

SAMPLE MATRIX: WATER

SWOK ID: 45949.01MS

METHOD REFERENCE: 8021

DATE RECEIVED: 03/03/01

PROJECT: PKI/26682

DATE ANALYZED: 03/14/01

DILUTION: 500

BLANK ID: X010314A

RESULTS REPORTED IN ug/L OR PARTS PER BILLION (PPB)

PARAMETER	QUANTITATION LIMIT	RESULTS	Q
CHLOROMETHANE	500	9200	
VINYL CHLORIDE	500	9000	
BROMOMETHANE	500	9500	
CHLOROETHANE	500	9100	
TRICHLOROFLUOROMETHANE	500	9200	
1,1-DICHLOROETHENE	500	8700	
METHYLENE CHLORIDE	500	7700	
trans-1,2-DICHLOROETHENE	500	9100	
1,1-DICHLOROETHANE	500	9100	
CHLOROFORM	500	8800	
1,1,1-TRICHLOROETHANE	500	9000	
CARBON TETRACHLORIDE	500	8600	
1,2-DICHLOROETHANE	500	8900	
TRICHLOROETHENE	500	12000	
1,2-DICHLOROPROPANE	500	9200	
BROMODICHLOROMETHANE	500	8400	
2-CHLOROETHYL VINYL ETHER	500	13000	
cis-1,3-DICHLOROPROPENE	500	9200	
trans-1,3-DICHLOROPROPENE	500	9400	
1,1,2-TRICHLOROETHANE	500	7900	
TETRACHLOROETHENE	500	8200	
DIBROMOCHLOROMETHANE	500	8800	
CHLOROBENZENE	500	8500	
BROMOFORM	500	7800	
1,1,2,2-TETRACHLOROETHANE	500	8100	
1,3-DICHLOROBENZENE	500	8300	
1,4-DICHLOROBENZENE	500	8300	
1,2-DICHLOROBENZENE	500	8100	

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/15/01

DATA FILE: X7063.D

SAMPLE ID: GWM-19 GWMS

SAMPLE MATRIX: WATER

SWOK ID: 45949.01MS

METHOD REFERENCE: 8021

DATE RECEIVED: 03/03/01

PROJECT: PKI/26682

DATE ANALYZED: 03/14/01

DILUTION: 500

BLANK ID: X010314A

QA/QC SURROGATE RECOVERIES

=====

2-BROMO-1-CHLOROPROPANE	(72-119)	91%
2-BROMOCHLOROBENZENE	(71-123)	88%

U = NOT DETECTED

\* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS, FAILED TWICE

Page 2 of 2

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/15/01

DATA FILE: X7064.D

SAMPLE ID: GWM-19 GWMSD

SAMPLE MATRIX: WATER

SWOK ID: 45949.01MSD

METHOD REFERENCE: 8021

DATE RECEIVED: 03/03/01

PROJECT: PKI/26682

DATE ANALYZED: 03/14/01

DILUTION: 500

BLANK ID: X010314A

RESULTS REPORTED IN ug/L OR PARTS PER BILLION (PPB)

PARAMETER	QUANTITATION LIMIT	RESULTS	Q
CHLOROMETHANE	500	9300	
VINYL CHLORIDE	500	9000	
BROMOMETHANE	500	9300	
CHLOROETHANE	500	8400	
TRICHLOROFLUOROMETHANE	500	8900	
1,1-DICHLOROETHENE	500	8800	
METHYLENE CHLORIDE	500	8000	
trans-1,2-DICHLOROETHENE	500	8900	
1,1-DICHLOROETHANE	500	8900	
CHLOROFORM	500	9000	
1,1,1-TRICHLOROETHANE	500	9200	
CARBON TETRACHLORIDE	500	8700	
1,2-DICHLOROETHANE	500	9300	
TRICHLOROETHENE	500	12000	
1,2-DICHLOROPROPANE	500	9600	
BROMODICHLOROMETHANE	500	8700	
2-CHLOROETHYL VINYL ETHER	500	7900	
cis-1,3-DICHLOROPROPENE	500	9400	
trans-1,3-DICHLOROPROPENE	500	9800	
1,1,2-TRICHLOROETHANE	500	8500	
TETRACHLOROETHENE	500	8600	
DIBROMOCHLOROMETHANE	500	9300	
CHLOROBENZENE	500	8700	
BROMOFORM	500	8200	
1,1,2,2-TETRACHLOROETHANE	500	8700	
1,3-DICHLOROBENZENE	500	8600	
1,4-DICHLOROBENZENE	500	8900	
1,2-DICHLOROBENZENE	500	8500	

SOUTHWEST LABORATORY OF OKLAHOMA  
GAS CHROMATOGRAPHY LABORATORY

REPORT DATE: 03/15/01

DATA FILE: X7064.D

SAMPLE ID: GWM-19 GWMSD

SAMPLE MATRIX: WATER

SWOK ID: 45949.01MSD

METHOD REFERENCE: 8021

DATE RECEIVED: 03/03/01

PROJECT: PKI/26682

DATE ANALYZED: 03/14/01

DILUTION: 500

BLANK ID: X010314A

QA/QC SURROGATE RECOVERIES

=====

2-BROMO-1-CHLOROPROPANE	(72-119)	93%
2-BROMOCHLOROBENZENE	(71-123)	87%

U = NOT DETECTED

\* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS, FAILED TWICE

Site Reassessment Investigation  
Chicago Heights Boulevard VOC Plume Site  
Overland, MO

RECEIVED

MAY 25 2001

HAZARDOUS WASTE PROGRAM  
MISSOURI DEPARTMENT OF  
NATURAL RESOURCES

**Site Information:**

LDPR Code: OEPA4  
Job Code: NJ00CHBD  
Investigation Date: 4/24/01

ESP Staff: Brian Allen  
HWP Staff: Nancy Priddy

**Introduction:**

HWP requested ESP personnel conduct sampling as part of a Site Reassessment investigation being conducted at the Chicago Heights Boulevard VOC Plume site in Overland, St. Louis County, Missouri. ESP Environmental Specialist Brian Allen traveled to the site on April 24, 2001, to collect indoor air samples and water grab samples from within selected residences located in the area of concern. HWP Environmental Specialist Nancy Priddy was present on-site throughout sampling to direct sampling locations and provide assistance. HWP Environmental Specialist Lance Livesay and Missouri Department of Health's Randy Maley were present during a portion of the sampling event. Mr. John Hessmann, representing Burns & McDonnell, the consultant for the potentially responsible party, was also present during a portion of the sampling event to split selected air and water samples. Sampling was conducted in accordance with established standard operating procedures within the MDNR, ESP.

**Observations:**

Upon arrival, personnel made contact with residents whose homes had been selected as sampling points. Most homes where indoor air samples were collected also had sump pumps within the basement, which had water present within the sumps. No discernible odors were noted within any of the residences during the sampling event.

**Field Methods:**

ESP personnel collected indoor air samples by deploying clean, evacuated 6-liter summa canisters, equipped with 8-hour flow controllers in a total of five residences. The initial and final vacuum of each canister, as well as the beginning and ending time of each sample run was recorded in a field notebook and onto a chain-of-custody form. Summa canisters and flow controllers were provided by Air Toxics Limited, which also conducted TO-15 analysis for all indoor air samples.

A total of five water grab samples were collected from basement sump areas by gently immersing sample containers directly into the water. Sample containers were verified to have no headspace then placed on ice in a cooler immediately after collection.

Site Reassessment Sampling Memorandum  
 Chicago Heights Boulevard VOC Plume Site  
 April 24, 2001  
 Page Two

All samples received a numbered label and sample custody maintained until reaching the respective laboratories for analyses. Each sample number was entered onto a chain-of-custody form indicating the date and time of collection and the location each sample was collected. Refer to Table 1 for a description, location, and time of each water grab sample collected. Refer to Table 2 for the location of each indoor air sample collected.

All water grab samples were transported back to the ESP laboratory in Jefferson City and submitted for volatile organics analysis. Instructions were relayed to analyze samples via TCLP, if applicable. All indoor air samples were shipped by carrier to the Air Toxics Limited analytical laboratory for TO-15 analysis.

Table 1  
 Water Samples

Sample Number	Sample Description
0119858	Trip blank. Analyte-free water prepared at the ESP laboratory on 4/23/01.
██████████	Water grab of basement sump in residence located at ██████████. The sample appeared clear and colorless with no odors noted and was collected on 4/24/01 @ 0809.
██████████	Water grab of basement sump in residence located at ██████████. The sample appeared clear and colorless with no odors noted and was collected on 4/24/01 @ 0904.
██████████	Water grab of basement sump in residence located at ██████████. The sample appeared clear and colorless with no odors noted and was collected on 4/24/01 @ 0915.
██████████	Water grab of basement sump in residence located at ██████████. The sample appeared clear and colorless with no odors noted and was collected on 4/24/01 @ 0928.
██████████	Water grab of basement sump in residence located at ██████████. The sample appeared clear and colorless with no odors noted and was collected on 4/24/01 @ 1318.
██████████	Duplicate sample of 0119863. Entered onto chain-of-custody as "Blind duplicate". Same description as above.

Table 2  
 Indoor Air Samples

Sample Number	Sample Description
██████████	8-hr indoor air sample collected from residential basement located at ██████████ Place. Summa canister was placed on the floor adjacent to basement sump.
██████████	8-hr indoor air sample collected from residential basement located at ██████████ Place. Summa canister was placed on the floor adjacent to the house's furnace system. No basement sump was located at this residence.
██████████	8-hr indoor air sample collected from residential basement located at ██████████ Place. Summa canister was placed on the floor adjacent to basement sump.
██████████	8-hr indoor air sample collected from residential basement located at ██████████ Place. Summa canister was placed on the floor adjacent to basement sump.
██████████	8-hr indoor air sample collected from residential basement located at ██████████ Place. Summa canister was placed on the floor, adjacent to the washer/dryer hookups. No basement sump was located at this residence.

Site Screening Memorandum  
Chicago Heights Boulevard VOC Plume Site  
April 24, 2001  
Page Three

Refer to the site map for the approximate residential locations of samples collected. Copies of field notes and the chain-of-custodies were forwarded to HWP under separate cover. Analytical results of samples collected are attached. A final report from Air Toxics Limited, which will include a data validation package, is pending and will be provided under separate cover once completed.



Brian J. Allen  
Environmental Specialist  
Superfund/RCRA Unit  
Environmental Services Program

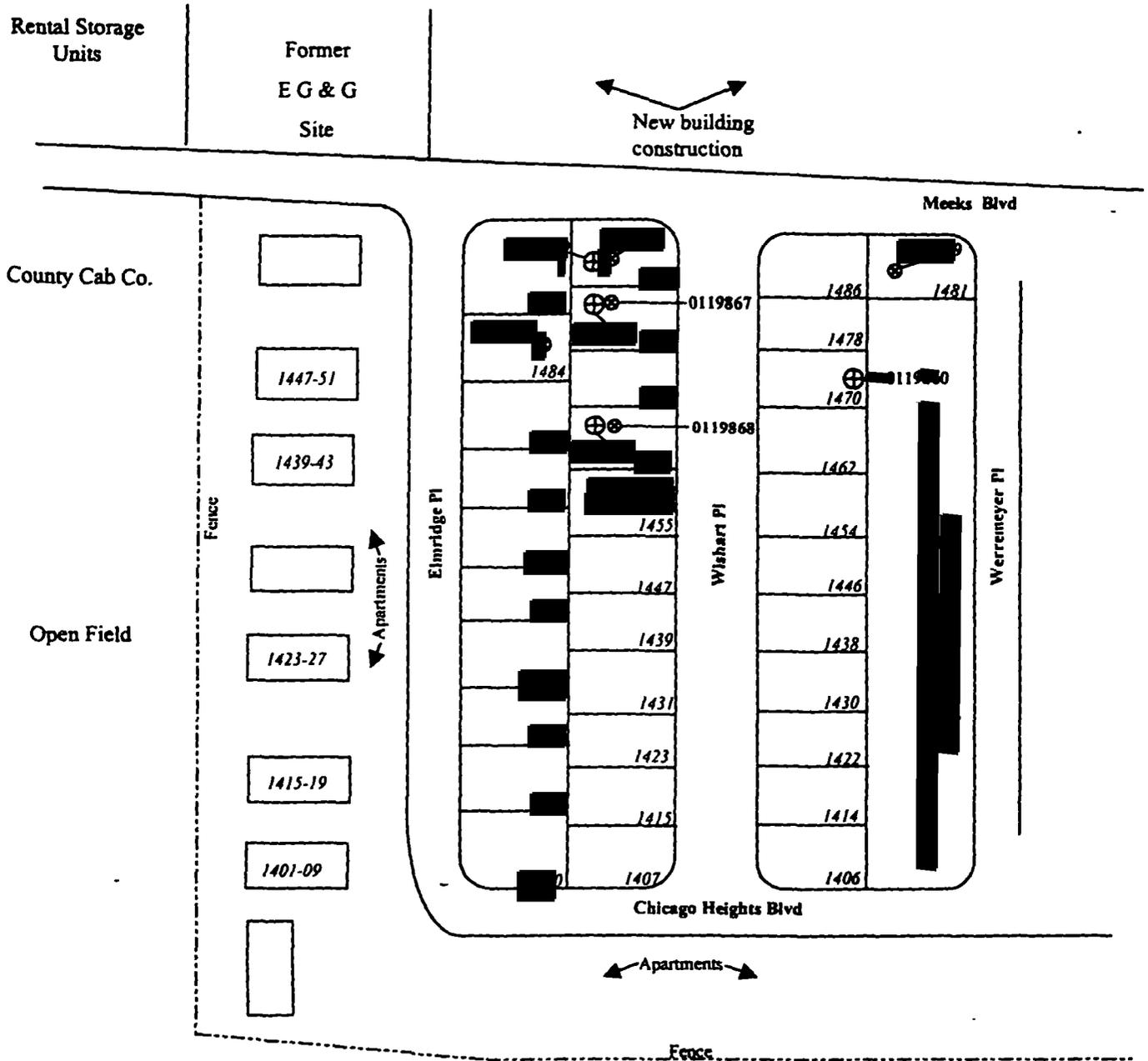
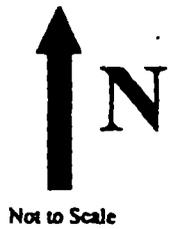
Date: \_\_\_\_\_

5/22/01

BJA:kl

c: Nancy Priddy, Environmental Specialist, HWP

**Site Map**  
**Chicago Heights Blvd VOC Plume Site**  
**Indoor Air/Water Sampling**  
**April 24, 2001**



<b>LEGEND</b>	
⊕	Water sample collected at location indicated
⊙	Air sample collected at location indicated
1415	Property/building address
011XXXX	Sample collected at location indicated

**Analytical Results**  
**Water samples**  
**Chicago Heights Boulevard VOC Plume Site**  
**Overland, MO**  
**April 24, 2001**

STATE OF MISSOURI Bob Holden, Governor • Stephen M. Mahfood, Director  
**DEPARTMENT OF NATURAL RESOURCES**

DIVISION OF ENVIRONMENTAL QUALITY  
P.O. Box 176 Jefferson City, MO 65102-0176

ENVIRONMENTAL SERVICES PROGRAM

RESULTS OF SAMPLE ANALYSES

Sample Number: [REDACTED]  
Lab Number: [REDACTED]

Reported To: BRIAN ALLEN	Report Date: 5/ 2/01	
Affiliation: ESP	Date Collected: 4/23/01	
LDPR/Job-Project: QEPA4/NJ00CHBD	Date Received: 4/25/01	
Sample Collected by: BRIAN ALLEN, ESP		
Sampling Location: CHICAGO HEIGHTS BLVD VOC PLUME		
Sample Description: TRIP BLANK		
County: ST. LOUIS		

Analysis Performed	Results	Analyzed	Method
VOA Results:			
Chloromethane	< 25.0 ug/L	4/25/01	8260
Vinyl Chloride	< 1.0 ug/L	4/25/01	8260
Bromomethane	< 5.0 ug/L	4/25/01	8260
Chloroethane	< 5.0 ug/L	4/25/01	8260
1,1-Dichloroethene	< 1.0 ug/L	4/25/01	8260
Acetone	< 20.0 ug/L	4/25/01	8260
Carbon Disulfide	< 1.0 ug/L	4/25/01	8260
Methylene Chloride	< 20.0 ug/L	4/25/01	8260
Methyl Tert-Butyl Ether	< 1.0 ug/L	4/25/01	8260
trans-1,2-Dichloroethene	< 1.0 ug/L	4/25/01	8260
1,1-Dichloroethane	< 1.0 ug/L	4/25/01	8260
2-Butanone	< 5.0 ug/L	4/25/01	8260
cis-1,2-Dichloroethene	< 1.0 ug/L	4/25/01	8260
Chloroform	< 1.0 ug/L	4/25/01	8260
1,1,1-Trichloroethane	< 1.0 ug/L	4/25/01	8260
Carbon Tetrachloride	< 1.0 ug/L	4/25/01	8260
Benzene	< 1.0 ug/L	4/25/01	8260
1,2-Dichloroethane	< 1.0 ug/L	4/25/01	8260
Trichloroethene	< 1.0 ug/L	4/25/01	8260
1,2-Dichloropropane	< 1.0 ug/L	4/25/01	8260
Bromodichloromethane	< 1.0 ug/L	4/25/01	8260
2-Hexanone	< 2.0 ug/L	4/25/01	8260
Trans-1,3-Dichloropropene	< 1.0 ug/L	4/25/01	8260

Analysis Performed	Results	Analyzed	Method
Toluene	< 1.0 ug/L	4/25/01	8260
CIS-1,3-Dichloropropene	< 1.0 ug/L	4/25/01	8260
1,1,2-Trichloroethane	< 1.0 ug/L	4/25/01	8260
4-Methyl-2-Pentanone	< 1.0 ug/L	4/25/01	8260
Tetrachloroethene	< 1.0 ug/L	4/25/01	8260
Dibromochloromethane	< 1.0 ug/L	4/25/01	8260
Chlorobenzene	< 1.0 ug/L	4/25/01	8260
Ethylbenzene	< 1.0 ug/L	4/25/01	8260
Total Xylenes	< 2.0 ug/L	4/25/01	8260
Styrene	< 1.0 ug/L	4/25/01	8260
Bromoform	< 1.0 ug/L	4/25/01	8260
1,1,2,2-Tetrachloroethane	< 1.0 ug/L	4/25/01	8260
1,3-Dichlorobenzene	< 1.0 ug/L	4/25/01	8260
1,4-Dichlorobenzene	< 1.0 ug/L	4/25/01	8260
1,2-Dichlorobenzene	< 1.0 ug/L	4/25/01	8260
Diethyl Ether	< 20.0 ug/L	4/25/01	8260
Iodomethane	< 5.0 ug/L	4/25/01	8260
Acrylonitrile	< 2.0 ug/L	4/25/01	8260
Allyl Chloride	< 1.0 ug/L	4/25/01	8260
Propionitrile	< 20.0 ug/L	4/25/01	8260
Methacrylonitrile	< 1.0 ug/L	4/25/01	8260
Methyl Acrylate	< 10.0 ug/L	4/25/01	8260
Tetrahydrofuran	< 5.0 ug/L	4/25/01	8260
1-Chlorobutane	< 1.0 ug/L	4/25/01	8260
Chloroacetonitrile	< 25.0 ug/L	4/25/01	8260
2-Nitropropane	< 1.0 ug/L	4/25/01	8260
Methylmethacrylate	< 1.0 ug/L	4/25/01	8260
1,1-Dichloropropanone	< 2.0 ug/L	4/25/01	8260
Ethyl Methacrylate	< 1.0 ug/L	4/25/01	8260
t-1,4-Dichloro-2-butene	< 1.0 ug/L	4/25/01	8260
Pentachloroethane	< 1.0 ug/L	4/25/01	8260
Hexachloroethane	< 1.0 ug/L	4/25/01	8260
Nitrobenzene	< 10.0 ug/L	4/25/01	8260
Dichlorodifluoromethane	< 1.0 ug/L	4/25/01	8260
Trichlorofluoromethane	< 5.0 ug/L	4/25/01	8260
2,2-Dichloropropane	< 1.0 ug/L	4/25/01	8260
Bromochloromethane	< 1.0 ug/L	4/25/01	8260
1,1-Dichloropropene	< 1.0 ug/L	4/25/01	8260
Dibromomethane	< 1.0 ug/L	4/25/01	8260
1,3-Dichloropropane	< 1.0 ug/L	4/25/01	8260
1,2-Dibromoethane	< 1.0 ug/L	4/25/01	8260
1,1,1,2-Tetrachloroethane	< 1.0 ug/L	4/25/01	8260
Isopropylbenzene	< 1.0 ug/L	4/25/01	8260
1,2,3-Trichloropropane	< 1.0 ug/L	4/25/01	8260
n-Propylbenzene	< 1.0 ug/L	4/25/01	8260
Bromobenzene	< 1.0 ug/L	4/25/01	8260
2-Chlorotoluene	< 1.0 ug/L	4/25/01	8260

Page 3  
Lab Number: 01-D1165  
Sample Number: 0119858  
May 2, 2001

Analysis Performed	Results	Analyzed	Method
4-Chlorotoluene	< 1.0 ug/L	4/25/01	8260
1,3,5-Trimethylbenzene	< 1.0 ug/L	4/25/01	8260
tert-Butylbenzene	< 2.0 ug/L	4/25/01	8260
1,2,4-Trimethylbenzene	< 1.0 ug/L	4/25/01	8260
sec-Butylbenzene	< 1.0 ug/L	4/25/01	8260
p-isopropyltoluene	< 1.0 ug/L	4/25/01	8260
n-Butylbenzene	< 1.0 ug/L	4/25/01	8260
1,2-Dibromo-3-Chloroprop	< 1.0 ug/L	4/25/01	8260
1,2,4-Trichlorobenzene	< 5.0 ug/L	4/25/01	8260
Hexachlorobutadiene	< 2.0 ug/L	4/25/01	8260
Naphthalene	< 5.0 ug/L	4/25/01	8260
1,2,3-Trichlorobenzene	< 5.0 ug/L	4/25/01	8260

The analysis of this sample was performed in accordance with procedures approved or recognized by the U.S. Environmental Protection Agency.



Douglas N. Edwards, Acting Director  
Environmental Services Program  
Division of Environmental Quality

c: VALERIE WILDER, HWP

STATE OF MISSOURI  
**DEPARTMENT OF NATURAL RESOURCES**

Bob Holden, Governor • Stephen M. Mahfood, Director  
 DIVISION OF ENVIRONMENTAL QUALITY  
 P.O. Box 176 Jefferson City, MO 65102-0176

ENVIRONMENTAL SERVICES PROGRAM

RESULTS OF SAMPLE ANALYSES

Sample Number: [REDACTED]  
 Lab Number: [REDACTED]

Reported To: BRIAN ALLEN	Report Date: 5/ 2/01	
Affiliation: ESP	Date Collected: 4/24/01	
LDPR/Job-Project: QEPA4/NJ00CHBD	Date Received: 4/25/01	

Sample Collected by: BRIAN ALLEN, ESP  
 Sampling Location: CHICAGO HEIGHTS BLVD VOC PLUME  
 Sample Description: WATER GRAB OF BASEMENT SUMP IN  
 RESIDENCE  
 AT [REDACTED] PLACE  
 County: ST. LOUIS

Analysis Performed	Results	Analyzed	Method
<b>VOA Results:</b>			
Chloromethane	< 25.0 ug/L	4/25/01	8260
Vinyl Chloride	< 1.0 ug/L	4/25/01	8260
Bromomethane	< 5.0 ug/L	4/25/01	8260
Chloroethane	< 5.0 ug/L	4/25/01	8260
1,1-Dichloroethene	< 1.0 ug/L	4/25/01	8260
Acetone	< 20.0 ug/L	4/25/01	8260
Carbon Disulfide	< 1.0 ug/L	4/25/01	8260
Methylene Chloride	< 20.0 ug/L	4/25/01	8260
Methyl Tert-Butyl Ether	< 1.0 ug/L	4/25/01	8260
trans-1,2-Dichloroethene	< 1.0 ug/L	4/25/01	8260
1,1-Dichloroethane	< 1.0 ug/L	4/25/01	8260
2-Butanone	< 5.0 ug/L	4/25/01	8260
cis-1,2-Dichloroethene	73.2 ug/L	4/25/01	8260
Chloroform	< 1.0 ug/L	4/25/01	8260
1,1,1-Trichloroethane	< 1.0 ug/L	4/25/01	8260
Carbon Tetrachloride	< 1.0 ug/L	4/25/01	8260
Benzene	< 1.0 ug/L	4/25/01	8260
1,2-Dichloroethane	< 1.0 ug/L	4/25/01	8260
Trichloroethene	1,140 ug/L	4/25/01	8260
1,2-Dichloropropane	< 1.0 ug/L	4/25/01	8260
Bromodichloromethane	< 1.0 ug/L	4/25/01	8260

Analysis Performed	Results	Unit	Analyzed	Method
2-Hexanone	< 2.0	ug/L	4/25/01	8260
Trans-1,3-Dichloropropene	< 1.0	ug/L	4/25/01	8260
Toluene	< 1.0	ug/L	4/25/01	8260
CIS-1,3-Dichloropropene	< 1.0	ug/L	4/25/01	8260
1,1,2-Trichloroethane	< 1.0	ug/L	4/25/01	8260
4-Methyl-2-Pentanone	< 1.0	ug/L	4/25/01	8260
Tetrachloroethene	1.5	ug/L	4/25/01	8260
Dibromochloromethane	< 1.0	ug/L	4/25/01	8260
Chlorobenzene	< 1.0	ug/L	4/25/01	8260
Ethylbenzene	< 1.0	ug/L	4/25/01	8260
Total Xylenes	< 2.0	ug/L	4/25/01	8260
Styrene	< 1.0	ug/L	4/25/01	8260
Bromoform	< 1.0	ug/L	4/25/01	8260
1,1,2,2-Tetrachloroethane	< 1.0	ug/L	4/25/01	8260
1,3-Dichlorobenzene	< 1.0	ug/L	4/25/01	8260
1,4-Dichlorobenzene	< 1.0	ug/L	4/25/01	8260
1,2-Dichlorobenzene	< 1.0	ug/L	4/25/01	8260
Diethyl Ether	< 20.0	ug/L	4/25/01	8260
Iodomethane	< 5.0	ug/L	4/25/01	8260
Acrylonitrile	< 2.0	ug/L	4/25/01	8260
Allyl Chloride	< 1.0	ug/L	4/25/01	8260
Propionitrile	< 20.0	ug/L	4/25/01	8260
Methacrylonitrile	< 1.0	ug/L	4/25/01	8260
Methyl Acrylate	< 10.0	ug/L	4/25/01	8260
Tetrahydrofuran	< 5.0	ug/L	4/25/01	8260
1-Chlorobutane	< 1.0	ug/L	4/25/01	8260
Chloroacetonitrile	< 25.0	ug/L	4/25/01	8260
2-Nitropropane	< 1.0	ug/L	4/25/01	8260
Methylmethacrylate	< 1.0	ug/L	4/25/01	8260
1,1-Dichloropropanone	< 2.0	ug/L	4/25/01	8260
Ethyl Methacrylate	< 1.0	ug/L	4/25/01	8260
t-1,4-Dichloro-2-butene	< 1.0	ug/L	4/25/01	8260
Pentachloroethane	< 1.0	ug/L	4/25/01	8260
Hexachloroethane	< 1.0	ug/L	4/25/01	8260
Nitrobenzene	< 10.0	ug/L	4/25/01	8260
Dichlorodifluoromethane	< 1.0	ug/L	4/25/01	8260
Trichlorofluoromethane	< 5.0	ug/L	4/25/01	8260
2,2-Dichloropropane	< 1.0	ug/L	4/25/01	8260
Bromochloromethane	< 1.0	ug/L	4/25/01	8260
1,1-Dichloropropene	< 1.0	ug/L	4/25/01	8260
Dibromomethane	< 1.0	ug/L	4/25/01	8260
1,3-Dichloropropane	< 1.0	ug/L	4/25/01	8260
1,2-Dibromoethane	< 1.0	ug/L	4/25/01	8260
1,1,1,2-Tetrachloroethane	< 1.0	ug/L	4/25/01	8260
Isopropylbenzene	< 1.0	ug/L	4/25/01	8260
1,2,3-Trichloropropane	< 1.0	ug/L	4/25/01	8260
n-Propylbenzene	< 1.0	ug/L	4/25/01	8260

Lab Number: 01-D1166

Sample Number: 0119859

May 2, 2001

Analysis Performed	Results	Analyzed	Method
Bromobenzene	< 1.0 ug/L	4/25/01	8260
2-Chlorotoluene	< 1.0 ug/L	4/25/01	8260
4-Chlorotoluene	< 1.0 ug/L	4/25/01	8260
1,3,5-Trimethylbenzene	< 1.0 ug/L	4/25/01	8260
tert-Butylbenzene	< 2.0 ug/L	4/25/01	8260
1,2,4-Trimethylbenzene	< 1.0 ug/L	4/25/01	8260
sec-Butylbenzene	< 1.0 ug/L	4/25/01	8260
p-isopropyltoluene	< 1.0 ug/L	4/25/01	8260
n-Butylbenzene	< 1.0 ug/L	4/25/01	8260
1,2-Dibromo-3-Chloroprop	< 1.0 ug/L	4/25/01	8260
1,2,4-Trichlorobenzene	< 5.0 ug/L	4/25/01	8260
Hexachlorobutadiene	< 2.0 ug/L	4/25/01	8260
Naphthalene	< 5.0 ug/L	4/25/01	8260
1,2,3-Trichlorobenzene	< 5.0 ug/L	4/25/01	8260
VOA TCLP Results:			
Vinyl Chloride (TCLP)	< 0.20 ppm	4/25/01	8260
1,1-Dichloroethene (TCLP)	< 0.70 ppm	4/25/01	8260
2-Butanone (TCLP)	< 0.01 ppm	4/25/01	8260
Chloroform (TCLP)	< 6.00 ppm	4/25/01	8260
Carbon Tetrachlor. (TCLP)	< 0.50 ppm	4/25/01	8260
Benzene (TCLP)	< 0.50 ppm	4/25/01	8260
1,2-Dichloroethane (TCLP)	< 0.50 ppm	4/25/01	8260
Trichloroethene (TCLP)	1.14 ppm	4/25/01	8260
Tetrachloroethene (TCLP)	< 0.70 ppm	4/25/01	8260
Chlorobenzene (TCLP)	< 100 ppm	4/25/01	8260
1,4-Dichlorobenz. (TCLP)	< 7.50 ppm	4/25/01	8260

## VOA Comments:

A 1:10 dilution was analyzed on 4/25/01 to quantitate TCE.

The analysis of this sample was performed in accordance with procedures approved or recognized by the U.S. Environmental Protection Agency.



Douglas N. Edwards, Acting Director  
Environmental Services Program  
Division of Environmental Quality

c: VALERIE WILDER, HWP

STATE OF MISSOURI  
 DEPARTMENT OF NATURAL RESOURCES

Bob Holden, Governor • Stephen M. Mahfood, Director

DIVISION OF ENVIRONMENTAL QUALITY  
 P.O. Box 176 Jefferson City, MO 65102-0176

ENVIRONMENTAL SERVICES PROGRAM

RESULTS OF SAMPLE ANALYSES

Sample Number: [REDACTED]

Reported To: BRIAN ALLEN  
 Affiliation: ESP  
 LDPR/Job-Project: QEPA4/NJ00CHBD

Report Date: 5/ 2/01  
 Date Collected: 4/24/01  
 Date Received: 4/25/01

Sample Collected by: BRIAN ALLEN, ESP  
 Sampling Location: CHICAGO HEIGHTS BLVD VOC PLUME  
 Sample Description: WATER GRAB OF BASEMENT SUMP IN  
 RESIDENCE  
 AT [REDACTED] PLACE  
 County: ST. LOUIS

Analysis Performed	Results	Analyzed	Method
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VOA Results:

Chloromethane	< 25.0	ug/L	4/25/01	8260
Vinyl Chloride	< 1.0	ug/L	4/25/01	8260
Bromomethane	< 5.0	ug/L	4/25/01	8260
Chloroethane	< 5.0	ug/L	4/25/01	8260
1,1-Dichloroethane	< 1.0	ug/L	4/25/01	8260
Acetone	< 20.0	ug/L	4/25/01	8260
Carbon Disulfide	< 1.0	ug/L	4/25/01	8260
Methylene Chloride	< 20.0	ug/L	4/25/01	8260
Methyl Tert-Butyl Ether	< 1.0	ug/L	4/25/01	8260
trans-1,2-Dichloroethene	< 1.0	ug/L	4/25/01	8260
1,1-Dichloroethane	< 1.0	ug/L	4/25/01	8260
2-Butanone	< 5.0	ug/L	4/25/01	8260
cis-1,2-Dichloroethene	< 1.0	ug/L	4/25/01	8260
Chloroform	25.5	ug/L	4/25/01	8260
1,1,1-Trichloroethane	< 1.0	ug/L	4/25/01	8260
Carbon Tetrachloride	< 1.0	ug/L	4/25/01	8260
Benzene	< 1.0	ug/L	4/25/01	8260
1,2-Dichloroethane	< 1.0	ug/L	4/25/01	8260
Trichloroethene	< 1.0	ug/L	4/25/01	8260
1,2-Dichloropropane	< 1.0	ug/L	4/25/01	8260
Bromodichloromethane	< 1.0	ug/L	4/25/01	8260

Lab Number: 01-D1167

Sample Number: 0119860

May 2, 2001

Analysis Performed	Results	Analyzed	Method
2-Hexanone	< 2.0 ug/L	4/25/01	8260
Trans-1,3-Dichloropropene	< 1.0 ug/L	4/25/01	8260
Toluene	< 1.0 ug/L	4/25/01	8260
CIS-1,3-Dichloropropene	< 1.0 ug/L	4/25/01	8260
1,1,2-Trichloroethane	< 1.0 ug/L	4/25/01	8260
4-Methyl-2-Pentanone	< 1.0 ug/L	4/25/01	8260
Tetrachloroethene	< 1.0 ug/L	4/25/01	8260
Dibromochloromethane	< 1.0 ug/L	4/25/01	8260
Chlorobenzene	< 1.0 ug/L	4/25/01	8260
Ethylbenzene	< 1.0 ug/L	4/25/01	8260
Total Xylenes	< 2.0 ug/L	4/25/01	8260
Styrene	< 1.0 ug/L	4/25/01	8260
Bromoform	< 1.0 ug/L	4/25/01	8260
1,1,2,2-Tetrachloroethane	< 1.0 ug/L	4/25/01	8260
1,3-Dichlorobenzene	< 1.0 ug/L	4/25/01	8260
1,4-Dichlorobenzene	< 1.0 ug/L	4/25/01	8260
1,2-Dichlorobenzene	< 1.0 ug/L	4/25/01	8260
Diethyl Ether	< 20.0 ug/L	4/25/01	8260
Iodomethane	< 5.0 ug/L	4/25/01	8260
Acrylonitrile	< 2.0 ug/L	4/25/01	8260
Allyl Chloride	< 1.0 ug/L	4/25/01	8260
Propionitrile	< 20.0 ug/L	4/25/01	8260
Methacrylonitrile	< 1.0 ug/L	4/25/01	8260
Methyl Acrylate	< 10.0 ug/L	4/25/01	8260
Tetrahydrofuran	< 5.0 ug/L	4/25/01	8260
1-Chlorobutane	< 1.0 ug/L	4/25/01	8260
Chloroacetonitrile	< 25.0 ug/L	4/25/01	8260
2-Nitropropane	< 1.0 ug/L	4/25/01	8260
Methylmethacrylate	< 1.0 ug/L	4/25/01	8260
1,1-Dichloropropanone	< 2.0 ug/L	4/25/01	8260
Ethyl Methacrylate	< 1.0 ug/L	4/25/01	8260
t-1,4-Dichloro-2-butene	< 1.0 ug/L	4/25/01	8260
Pentachloroethane	< 1.0 ug/L	4/25/01	8260
Hexachloroethane	< 1.0 ug/L	4/25/01	8260
Nitrobenzene	< 10.0 ug/L	4/25/01	8260
Dichlorodifluoromethane	< 1.0 ug/L	4/25/01	8260
Trichlorofluoromethane	< 5.0 ug/L	4/25/01	8260
2,2-Dichloropropane	< 1.0 ug/L	4/25/01	8260
Bromochloromethane	< 1.0 ug/L	4/25/01	8260
1,1-Dichloropropene	< 1.0 ug/L	4/25/01	8260
Dibromomethane	< 1.0 ug/L	4/25/01	8260
1,3-Dichloropropane	< 1.0 ug/L	4/25/01	8260
1,2-Dibromoethane	< 1.0 ug/L	4/25/01	8260
1,1,1,2-Tetrachloroethane	< 1.0 ug/L	4/25/01	8260
Isopropylbenzene	< 1.0 ug/L	4/25/01	8260
1,2,3-Trichloropropane	< 1.0 ug/L	4/25/01	8260
n-Propylbenzene	< 1.0 ug/L	4/25/01	8260

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Lab Number: 01-D1167

Sample Number: 0119860

May 2, 2001

Analysis Performed	Results	Analyzed	Method
Bromobenzene	< 1.0 ug/L	4/25/01	8260
2-Chlorotoluene	< 1.0 ug/L	4/25/01	8260
4-Chlorotoluene	< 1.0 ug/L	4/25/01	8260
1,3,5-Trimethylbenzene	< 1.0 ug/L	4/25/01	8260
tert-Butylbenzene	< 2.0 ug/L	4/25/01	8260
1,2,4-Trimethylbenzene	< 1.0 ug/L	4/25/01	8260
sec-Butylbenzene	< 1.0 ug/L	4/25/01	8260
p-isopropyltoluene	< 1.0 ug/L	4/25/01	8260
n-Butylbenzene	< 1.0 ug/L	4/25/01	8260
1,2-Dibromo-3-Chloroprop	< 1.0 ug/L	4/25/01	8260
1,2,4-Trichlorobenzene	< 5.0 ug/L	4/25/01	8260
Hexachlorobutadiene	< 2.0 ug/L	4/25/01	8260
Naphthalene	< 5.0 ug/L	4/25/01	8260
1,2,3-Trichlorobenzene	< 5.0 ug/L	4/25/01	8260

The analysis of this sample was performed in accordance with procedures approved or recognized by the U.S. Environmental Protection Agency.



Douglas N. Edwards, Acting Director  
Environmental Services Program  
Division of Environmental Quality

c: VALERIE WILDER, HWP

STATE OF MISSOURI Bob Holden, Governor • Stephen M. Mahford, Director  
**DEPARTMENT OF NATURAL RESOURCES**

DIVISION OF ENVIRONMENTAL QUALITY  
P.O. Box 176 Jefferson City, MO 65102-0176

ENVIRONMENTAL SERVICES PROGRAM

RESULTS OF SAMPLE ANALYSES

Sample Number: [REDACTED]  
Lab Number: 01-D1168

Reported To: BRIAN ALLEN	Report Date: 5/ 2/01
Affiliation: ESP	Date Collected: 4/24/01
LDPR/Job-Project: QEPA4/NJ00CHBD	Date Received: 4/25/01
Sample Collected by: BRIAN ALLEN, ESP	
Sampling Location: CHICAGO HEIGHTS BLVD VOC PLUME	
Sample Description: WATER GRAB OF BASEMENT SUMP IN RESIDENCE	
AT [REDACTED] PLACE	
County: ST. LOUIS	

Analysis Performed	Results	Analyzed	Method
<b>VOA Results:</b>			
Chloromethane	< 25.0 ug/L	4/25/01	8260
Vinyl Chloride	< 1.0 ug/L	4/25/01	8260
Bromomethane	< 5.0 ug/L	4/25/01	8260
Chloroethane	< 5.0 ug/L	4/25/01	8260
1,1-Dichloroethene	< 1.0 ug/L	4/25/01	8260
Acetone	< 20.0 ug/L	4/25/01	8260
Carbon Disulfide	< 1.0 ug/L	4/25/01	8260
Methylene Chloride	< 20.0 ug/L	4/25/01	8260
Methyl Tert-Butyl Ether	< 1.0 ug/L	4/25/01	8260
trans-1,2-Dichloroethene	< 1.0 ug/L	4/25/01	8260
1,1-Dichloroethane	< 1.0 ug/L	4/25/01	8260
2-Butanone	< 5.0 ug/L	4/25/01	8260
cis-1,2-Dichloroethene	83.7 ug/L	4/25/01	8260
Chloroform	< 1.0 ug/L	4/25/01	8260
1,1,1-Trichloroethane	< 1.0 ug/L	4/25/01	8260
Carbon Tetrachloride	< 1.0 ug/L	4/25/01	8260
Benzene	< 1.0 ug/L	4/25/01	8260
1,2-Dichloroethane	< 1.0 ug/L	4/25/01	8260
Trichloroethene	66.5 ug/L	4/25/01	8260
1,2-Dichloropropane	< 1.0 ug/L	4/25/01	8260
Bromodichloromethane	< 1.0 ug/L	4/25/01	8260

Analysis Performed	Results	Analyzed	Method
2-Hexanone	< 2.0 ug/L	4/25/01	8260
Trans-1,3-Dichloropropene	< 1.0 ug/L	4/25/01	8260
Toluene	< 1.0 ug/L	4/25/01	8260
CIS-1,3-Dichloropropene	< 1.0 ug/L	4/25/01	8260
1,1,2-Trichloroethane	< 1.0 ug/L	4/25/01	8260
4-Methyl-2-Pentanone	< 1.0 ug/L	4/25/01	8260
Tetrachloroethene	< 1.0 ug/L	4/25/01	8260
Dibromochloromethane	< 1.0 ug/L	4/25/01	8260
Chlorobenzene	< 1.0 ug/L	4/25/01	8260
Ethylbenzene	< 1.0 ug/L	4/25/01	8260
Total Xylenes	< 2.0 ug/L	4/25/01	8260
Styrene	< 1.0 ug/L	4/25/01	8260
Bromoform	< 1.0 ug/L	4/25/01	8260
1,1,2,2-Tetrachloroethane	< 1.0 ug/L	4/25/01	8260
1,3-Dichlorobenzene	< 1.0 ug/L	4/25/01	8260
1,4-Dichlorobenzene	< 1.0 ug/L	4/25/01	8260
1,2-Dichlorobenzene	< 1.0 ug/L	4/25/01	8260
Diethyl Ether	< 20.0 ug/L	4/25/01	8260
Iodomethane	< 5.0 ug/L	4/25/01	8260
Acrylonitrile	< 2.0 ug/L	4/25/01	8260
Allyl Chloride	< 1.0 ug/L	4/25/01	8260
Propionitrile	< 20.0 ug/L	4/25/01	8260
Methacrylonitrile	< 1.0 ug/L	4/25/01	8260
Methyl Acrylate	< 10.0 ug/L	4/25/01	8260
Tetrahydrofuran	< 5.0 ug/L	4/25/01	8260
1-Chlorobutane	< 1.0 ug/L	4/25/01	8260
Chloroacetonitrile	< 25.0 ug/L	4/25/01	8260
2-Nitropropane	< 1.0 ug/L	4/25/01	8260
Methylmethacrylate	< 1.0 ug/L	4/25/01	8260
1,1-Dichloropropanone	< 2.0 ug/L	4/25/01	8260
Ethyl Methacrylate	< 1.0 ug/L	4/25/01	8260
t-1,4-Dichloro-2-butene	< 1.0 ug/L	4/25/01	8260
Pentachloroethane	< 1.0 ug/L	4/25/01	8260
Hexachloroethane	< 1.0 ug/L	4/25/01	8260
Nitrobenzene	< 10.0 ug/L	4/25/01	8260
Dichlorodifluoromethane	< 1.0 ug/L	4/25/01	8260
Trichlorofluoromethane	< 5.0 ug/L	4/25/01	8260
2,2-Dichloropropane	< 1.0 ug/L	4/25/01	8260
Bromochloromethane	< 1.0 ug/L	4/25/01	8260
1,1-Dichloropropene	< 1.0 ug/L	4/25/01	8260
Dibromomethane	< 1.0 ug/L	4/25/01	8260
1,3-Dichloropropane	< 1.0 ug/L	4/25/01	8260
1,2-Dibromoethane	< 1.0 ug/L	4/25/01	8260
1,1,1,2-Tetrachloroethane	< 1.0 ug/L	4/25/01	8260
Isopropylbenzene	< 1.0 ug/L	4/25/01	8260
1,2,3-Trichloropropane	< 1.0 ug/L	4/25/01	8260
n-Propylbenzene	< 1.0 ug/L	4/25/01	8260

Lab Number: 01-D1168

Sample Number: 0119861

May 2, 2001

Analysis Performed	Results	Analyzed	Method
Bromobenzene	< 1.0 ug/L	4/25/01	8260
2-Chlorotoluene	< 1.0 ug/L	4/25/01	8260
4-Chlorotoluene	< 1.0 ug/L	4/25/01	8260
1,3,5-Trimethylbenzene	< 1.0 ug/L	4/25/01	8260
tert-Butylbenzene	< 2.0 ug/L	4/25/01	8260
1,2,4-Trimethylbenzene	< 1.0 ug/L	4/25/01	8260
sec-Butylbenzene	< 1.0 ug/L	4/25/01	8260
p-isopropyltoluene	< 1.0 ug/L	4/25/01	8260
n-Butylbenzene	< 1.0 ug/L	4/25/01	8260
1,2-Dibromo-3-Chloroprop	< 1.0 ug/L	4/25/01	8260
1,2,4-Trichlorobenzene	< 5.0 ug/L	4/25/01	8260
Hexachlorobutadiene	< 2.0 ug/L	4/25/01	8260
Naphthalene	< 5.0 ug/L	4/25/01	8260
1,2,3-Trichlorobenzene	< 5.0 ug/L	4/25/01	8260

The analysis of this sample was performed in accordance with procedures approved or recognized by the U.S. Environmental Protection Agency.



Douglas N. Edwards, Acting Director  
Environmental Services Program  
Division of Environmental Quality

c: VALERIE WILDER, HWP

STATE OF MISSOURI  
 DEPARTMENT OF NATURAL RESOURCES

Bob Holden, Governor • Stephen M. Mahfouz, Director

DIVISION OF ENVIRONMENTAL QUALITY  
 P.O. Box 176 Jefferson City, MO 65102-0176

ENVIRONMENTAL SERVICES PROGRAM

RESULTS OF SAMPLE ANALYSES

Sample Number: [REDACTED]  
 Lab Number: 01-D1169

Reported To: BRIAN ALLEN	Report Date: 5/ 2/01
Affiliation: ESP	Date Collected: 4/24/01
LDPR/Job-Project: QEPA4/NJ00CHBD	Date Received: 4/25/01
Sample Collected by: BRIAN ALLEN, ESP	
Sampling Location: CHICAGO HEIGHTS BLVD VOC PLUME	
Sample Description: WATER GRAB OF BASEMENT SUMP IN RESIDENCE	
AT [REDACTED] PLACE	
County: ST. LOUIS	

Analysis Performed	Results	Analyzed	Method
VOA Results:			
Chloromethane	< 25.0 ug/L	4/25/01	8260
Vinyl Chloride	< 1.0 ug/L	4/25/01	8260
Bromomethane	< 5.0 ug/L	4/25/01	8260
Chloroethane	< 5.0 ug/L	4/25/01	8260
1,1-Dichloroethene	< 1.0 ug/L	4/25/01	8260
Acetone	< 20.0 ug/L	4/25/01	8260
Carbon Disulfide	< 1.0 ug/L	4/25/01	8260
Methylene Chloride	< 20.0 ug/L	4/25/01	8260
Methyl Tert-Butyl Ether	< 1.0 ug/L	4/25/01	8260
trans-1,2-Dichloroethene	< 1.0 ug/L	4/25/01	8260
1,1-Dichloroethane	< 1.0 ug/L	4/25/01	8260
2-Butanone	< 5.0 ug/L	4/25/01	8260
cis-1,2-Dichloroethene	< 1.0 ug/L	4/25/01	8260
Chloroform	< 1.0 ug/L	4/25/01	8260
1,1,1-Trichloroethane	< 1.0 ug/L	4/25/01	8260
Carbon Tetrachloride	< 1.0 ug/L	4/25/01	8260
Benzene	< 1.0 ug/L	4/25/01	8260
1,2-Dichloroethane	< 1.0 ug/L	4/25/01	8260
Trichloroethene	< 1.0 ug/L	4/25/01	8260
1,2-Dichloropropane	< 1.0 ug/L	4/25/01	8260
Bromodichloromethane	< 1.0 ug/L	4/25/01	8260

Page 2  
 Lab Number: 01-D1169  
 Sample Number: 0119862  
 May 2, 2001

Analysis Performed	Results	Analyzed	Method
2-Hexanone	< 2.0 ug/L	4/25/01	8260
Trans-1,3-Dichloropropene	< 1.0 ug/L	4/25/01	8260
Toluene	< 1.0 ug/L	4/25/01	8260
CIS-1,3-Dichloropropene	< 1.0 ug/L	4/25/01	8260
1,1,2-Trichloroethane	< 1.0 ug/L	4/25/01	8260
4-Methyl-2-Pentanone	< 1.0 ug/L	4/25/01	8260
Tetrachloroethene	3.7 ug/L	4/25/01	8260
Dibromochloromethane	< 1.0 ug/L	4/25/01	8260
Chlorobenzene	< 1.0 ug/L	4/25/01	8260
Ethylbenzene	< 1.0 ug/L	4/25/01	8260
Total Xylenes	< 2.0 ug/L	4/25/01	8260
Styrene	< 1.0 ug/L	4/25/01	8260
Bromoform	< 1.0 ug/L	4/25/01	8260
1,1,2,2-Tetrachloroethane	< 1.0 ug/L	4/25/01	8260
1,3-Dichlorobenzene	< 1.0 ug/L	4/25/01	8260
1,4-Dichlorobenzene	< 1.0 ug/L	4/25/01	8260
1,2-Dichlorobenzene	< 1.0 ug/L	4/25/01	8260
Diethyl Ether	< 20.0 ug/L	4/25/01	8260
Iodomethane	< 5.0 ug/L	4/25/01	8260
Acrylonitrile	< 2.0 ug/L	4/25/01	8260
Allyl Chloride	< 1.0 ug/L	4/25/01	8260
Propionitrile	< 20.0 ug/L	4/25/01	8260
Methacrylonitrile	< 1.0 ug/L	4/25/01	8260
Methyl Acrylate	< 10.0 ug/L	4/25/01	8260
Tetrahydrofuran	< 5.0 ug/L	4/25/01	8260
1-Chlorobutane	< 1.0 ug/L	4/25/01	8260
Chloroacetonitrile	< 25.0 ug/L	4/25/01	8260
2-Nitropropane	< 1.0 ug/L	4/25/01	8260
Methylmethacrylate	< 1.0 ug/L	4/25/01	8260
1,1-Dichloropropanone	< 2.0 ug/L	4/25/01	8260
Ethyl Methacrylate	< 1.0 ug/L	4/25/01	8260
t-1,4-Dichloro-2-butene	< 1.0 ug/L	4/25/01	8260
Pentachloroethane	< 1.0 ug/L	4/25/01	8260
Hexachloroethane	< 1.0 ug/L	4/25/01	8260
Nitrobenzene	< 10.0 ug/L	4/25/01	8260
Dichlorodifluoromethane	< 1.0 ug/L	4/25/01	8260
Trichlorofluoromethane	< 5.0 ug/L	4/25/01	8260
2,2-Dichloropropane	< 1.0 ug/L	4/25/01	8260
Bromochloromethane	< 1.0 ug/L	4/25/01	8260
1,1-Dichloropropene	< 1.0 ug/L	4/25/01	8260
Dibromomethane	< 1.0 ug/L	4/25/01	8260
1,3-Dichloropropane	< 1.0 ug/L	4/25/01	8260
1,2-Dibromoethane	< 1.0 ug/L	4/25/01	8260
1,1,1,2-Tetrachloroethane	< 1.0 ug/L	4/25/01	8260
Isopropylbenzene	< 1.0 ug/L	4/25/01	8260
1,2,3-Trichloropropane	< 1.0 ug/L	4/25/01	8260
n-Propylbenzene	< 1.0 ug/L	4/25/01	8260

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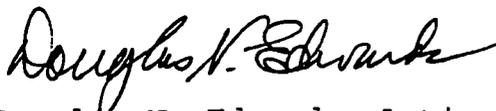
Lab Number: 01-D1169

Sample Number: 0119862

May 2, 2001

Analysis Performed	Results	Analyzed	Method
Bromobenzene	< 1.0 ug/L	4/25/01	8260
2-Chlorotoluene	< 1.0 ug/L	4/25/01	8260
4-Chlorotoluene	< 1.0 ug/L	4/25/01	8260
1,3,5-Trimethylbenzene	< 1.0 ug/L	4/25/01	8260
tert-Butylbenzene	< 2.0 ug/L	4/25/01	8260
1,2,4-Trimethylbenzene	< 1.0 ug/L	4/25/01	8260
sec-Butylbenzene	< 1.0 ug/L	4/25/01	8260
p-isopropyltoluene	< 1.0 ug/L	4/25/01	8260
n-Butylbenzene	< 1.0 ug/L	4/25/01	8260
1,2-Dibromo-3-Chloroprop	< 1.0 ug/L	4/25/01	8260
1,2,4-Trichlorobenzene	< 5.0 ug/L	4/25/01	8260
Hexachlorobutadiene	< 2.0 ug/L	4/25/01	8260
Naphthalene	< 5.0 ug/L	4/25/01	8260
1,2,3-Trichlorobenzene	< 5.0 ug/L	4/25/01	8260

The analysis of this sample was performed in accordance with procedures approved or recognized by the U.S. Environmental Protection Agency.



Douglas N. Edwards, Acting Director  
Environmental Services Program  
Division of Environmental Quality

c: VALERIE WILDER, HWP

STATE OF MISSOURI  
**DEPARTMENT OF NATURAL RESOURCES**

Bob Holden, Governor • Stephen M. Mahfouz, Director

DIVISION OF ENVIRONMENTAL QUALITY  
P.O. Box 176 Jefferson City, MO 65102-0176

ENVIRONMENTAL SERVICES PROGRAM

RESULTS OF SAMPLE ANALYSES

Sample Number: [REDACTED]  
Lab Number: 01-D1170

Reported To: BRIAN ALLEN	Report Date: 5/ 2/01
Affiliation: ESP	Date Collected: 4/24/01
LDPR/Job-Project: QEPA4/NJ00CHBD	Date Received: 4/25/01

Sample Collected by: BRIAN ALLEN, ESP  
Sampling Location: CHICAGO HEIGHTS BLVD VOC PLUME  
Sample Description: WATER GRAB OF BASEMENT SUMP IN  
RESIDENCE  
AT [REDACTED] PLACE  
County: ST. LOUIS

Analysis Performed	Results	Analyzed	Method
<b>VOA Results:</b>			
Chloromethane	< 25.0 ug/L	4/25/01	8260
Vinyl Chloride	< 1.0 ug/L	4/25/01	8260
Bromomethane	< 5.0 ug/L	4/25/01	8260
Chloroethane	< 5.0 ug/L	4/25/01	8260
1,1-Dichloroethene	< 1.0 ug/L	4/25/01	8260
Acetone	< 20.0 ug/L	4/25/01	8260
Carbon Disulfide	< 1.0 ug/L	4/25/01	8260
Methylene Chloride	< 20.0 ug/L	4/25/01	8260
Methyl Tert-Butyl Ether	< 1.0 ug/L	4/25/01	8260
trans-1,2-Dichloroethene	< 1.0 ug/L	4/25/01	8260
1,1-Dichloroethane	< 1.0 ug/L	4/25/01	8260
2-Butanone	< 5.0 ug/L	4/25/01	8260
cis-1,2-Dichloroethene	< 1.0 ug/L	4/25/01	8260
Chloroform	< 1.0 ug/L	4/25/01	8260
1,1,1-Trichloroethane	< 1.0 ug/L	4/25/01	8260
Carbon Tetrachloride	< 1.0 ug/L	4/25/01	8260
Benzene	< 1.0 ug/L	4/25/01	8260
1,2-Dichloroethane	< 1.0 ug/L	4/25/01	8260
Trichloroethene	< 1.0 ug/L	4/25/01	8260
1,2-Dichloropropane	< 1.0 ug/L	4/25/01	8260
Bromodichloromethane	< 1.0 ug/L	4/25/01	8260

Analysis Performed	Results	Analyzed	Method
2-Hexanone	< 2.0 ug/L	4/25/01	8260
Trans-1,3-Dichloropropene	< 1.0 ug/L	4/25/01	8260
Toluene	< 1.0 ug/L	4/25/01	8260
CIS-1,3-Dichloropropene	< 1.0 ug/L	4/25/01	8260
1,1,2-Trichloroethane	< 1.0 ug/L	4/25/01	8260
4-Methyl-2-Pentanone	< 1.0 ug/L	4/25/01	8260
Tetrachloroethene	2.3 ug/L	4/25/01	8260
Dibromochloromethane	< 1.0 ug/L	4/25/01	8260
Chlorobenzene	< 1.0 ug/L	4/25/01	8260
Ethylbenzene	< 1.0 ug/L	4/25/01	8260
Total Xylenes	< 2.0 ug/L	4/25/01	8260
Styrene	< 1.0 ug/L	4/25/01	8260
Bromoform	< 1.0 ug/L	4/25/01	8260
1,1,2,2-Tetrachloroethane	< 1.0 ug/L	4/25/01	8260
1,3-Dichlorobenzene	< 1.0 ug/L	4/25/01	8260
1,4-Dichlorobenzene	< 1.0 ug/L	4/25/01	8260
1,2-Dichlorobenzene	< 1.0 ug/L	4/25/01	8260
Diethyl Ether	< 20.0 ug/L	4/25/01	8260
Iodomethane	< 5.0 ug/L	4/25/01	8260
Acrylonitrile	< 2.0 ug/L	4/25/01	8260
Allyl Chloride	< 1.0 ug/L	4/25/01	8260
Propionitrile	< 20.0 ug/L	4/25/01	8260
Methacrylonitrile	< 1.0 ug/L	4/25/01	8260
Methyl Acrylate	< 10.0 ug/L	4/25/01	8260
Tetrahydrofuran	< 5.0 ug/L	4/25/01	8260
1-Chlorobutane	1.0 ug/L	4/25/01	8260
Chloroacetonitrile	< 25.0 ug/L	4/25/01	8260
2-Nitropropane	< 1.0 ug/L	4/25/01	8260
Methylmethacrylate	< 1.0 ug/L	4/25/01	8260
1,1-Dichloropropanone	< 2.0 ug/L	4/25/01	8260
Ethyl Methacrylate	< 1.0 ug/L	4/25/01	8260
t-1,4-Dichloro-2-butene	< 1.0 ug/L	4/25/01	8260
Pentachloroethane	< 1.0 ug/L	4/25/01	8260
Hexachloroethane	< 1.0 ug/L	4/25/01	8260
Nitrobenzene	< 10.0 ug/L	4/25/01	8260
Dichlorodifluoromethane	< 1.0 ug/L	4/25/01	8260
Trichlorofluoromethane	< 5.0 ug/L	4/25/01	8260
2,2-Dichloropropane	< 1.0 ug/L	4/25/01	8260
Bromochloromethane	< 1.0 ug/L	4/25/01	8260
1,1-Dichloropropene	< 1.0 ug/L	4/25/01	8260
Dibromomethane	< 1.0 ug/L	4/25/01	8260
1,3-Dichloropropane	< 1.0 ug/L	4/25/01	8260
1,2-Dibromoethane	< 1.0 ug/L	4/25/01	8260
1,1,1,2-Tetrachloroethane	< 1.0 ug/L	4/25/01	8260
Isopropylbenzene	< 1.0 ug/L	4/25/01	8260
1,2,3-Trichloropropane	< 1.0 ug/L	4/25/01	8260
n-Propylbenzene	< 1.0 ug/L	4/25/01	8260

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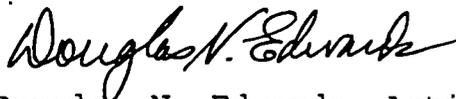
Lab Number: 01-D1170

Sample Number: 0119863

May 2, 2001

Analysis Performed	Results	Analyzed	Method
Bromobenzene	< 1.0 ug/L	4/25/01	8260
2-Chlorotoluene	< 1.0 ug/L	4/25/01	8260
4-Chlorotoluene	< 1.0 ug/L	4/25/01	8260
1,3,5-Trimethylbenzene	< 1.0 ug/L	4/25/01	8260
tert-Butylbenzene	< 2.0 ug/L	4/25/01	8260
1,2,4-Trimethylbenzene	< 1.0 ug/L	4/25/01	8260
sec-Butylbenzene	< 1.0 ug/L	4/25/01	8260
p-isopropyltoluene	< 1.0 ug/L	4/25/01	8260
n-Butylbenzene	< 1.0 ug/L	4/25/01	8260
1,2-Dibromo-3-Chloroprop	< 1.0 ug/L	4/25/01	8260
1,2,4-Trichlorobenzene	< 5.0 ug/L	4/25/01	8260
Hexachlorobutadiene	< 2.0 ug/L	4/25/01	8260
Naphthalene	< 5.0 ug/L	4/25/01	8260
1,2,3-Trichlorobenzene	< 5.0 ug/L	4/25/01	8260

The analysis of this sample was performed in accordance with procedures approved or recognized by the U.S. Environmental Protection Agency.



Douglas N. Edwards, Acting Director  
Environmental Services Program  
Division of Environmental Quality

c: VALERIE WILDER, HWP

STATE OF MISSOURI  
**DEPARTMENT OF NATURAL RESOURCES**

Bob Holden, Governor • Stephen M. Mahford, Director

DIVISION OF ENVIRONMENTAL QUALITY  
 P.O. Box 176 Jefferson City, MO 65102-0176

ENVIRONMENTAL SERVICES PROGRAM

RESULTS OF SAMPLE ANALYSES

Sample Number: XXXXXXXXXX  
 Lab Number: 01-D1171

Reported To: BRIAN ALLEN	Report Date: 5/ 2/01
Affiliation: ESP	Date Collected: 4/24/01
LDPR/Job-Project: QEPA4/NJ00CHBD	Date Received: 4/25/01
Sample Collected by: BRIAN ALLEN, ESP	
Sampling Location: CHICAGO HEIGHTS BLVD VOC PLUME	
Sample Description: BLIND DUPLICATE	
County: ST. LOUIS	

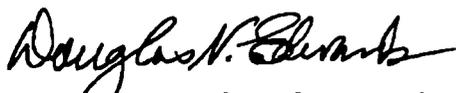
Analysis Performed	Results	Analyzed	Method
<b>VOA Results:</b>			
Chloromethane	< 25.0 ug/L	4/26/01	8260
Vinyl Chloride	< 1.0 ug/L	4/26/01	8260
Bromomethane	< 5.0 ug/L	4/26/01	8260
Chloroethane	< 5.0 ug/L	4/26/01	8260
1,1-Dichloroethene	< 1.0 ug/L	4/26/01	8260
Acetone	< 20.0 ug/L	4/26/01	8260
Carbon Disulfide	< 1.0 ug/L	4/26/01	8260
Methylene Chloride	< 20.0 ug/L	4/26/01	8260
Methyl Tert-Butyl Ether	< 1.0 ug/L	4/26/01	8260
trans-1,2-Dichloroethene	< 1.0 ug/L	4/26/01	8260
1,1-Dichloroethane	< 1.0 ug/L	4/26/01	8260
2-Butanone	< 5.0 ug/L	4/26/01	8260
cis-1,2-Dichloroethene	< 1.0 ug/L	4/26/01	8260
Chloroform	< 1.0 ug/L	4/26/01	8260
1,1,1-Trichloroethane	< 1.0 ug/L	4/26/01	8260
Carbon Tetrachloride	< 1.0 ug/L	4/26/01	8260
Benzene	< 1.0 ug/L	4/26/01	8260
1,2-Dichloroethane	< 1.0 ug/L	4/26/01	8260
Trichloroethene	< 1.0 ug/L	4/26/01	8260
1,2-Dichloropropane	< 1.0 ug/L	4/26/01	8260
Bromodichloromethane	< 1.0 ug/L	4/26/01	8260
2-Hexanone	< 2.0 ug/L	4/26/01	8260
Trans-1,3-Dichloropropene	< 1.0 ug/L	4/26/01	8260

Analysis Performed	Results	Analyzed	Method
Toluene	< 1.0 ug/L	4/26/01	8260
CIS-1,3-Dichloropropene	< 1.0 ug/L	4/26/01	8260
1,1,2-Trichloroethane	< 1.0 ug/L	4/26/01	8260
4-Methyl-2-Pentanone	< 1.0 ug/L	4/26/01	8260
Tetrachloroethene	2.1 ug/L	4/26/01	8260
Dibromochloromethane	< 1.0 ug/L	4/26/01	8260
Chlorobenzene	< 1.0 ug/L	4/26/01	8260
Ethylbenzene	< 1.0 ug/L	4/26/01	8260
Total Xylenes	< 2.0 ug/L	4/26/01	8260
Styrene	< 1.0 ug/L	4/26/01	8260
Bromoform	< 1.0 ug/L	4/26/01	8260
1,1,2,2-Tetrachloroethane	< 1.0 ug/L	4/26/01	8260
1,3-Dichlorobenzene	< 1.0 ug/L	4/26/01	8260
1,4-Dichlorobenzene	< 1.0 ug/L	4/26/01	8260
1,2-Dichlorobenzene	< 1.0 ug/L	4/26/01	8260
Diethyl Ether	< 20.0 ug/L	4/26/01	8260
Iodomethane	< 5.0 ug/L	4/26/01	8260
Acrylonitrile	< 2.0 ug/L	4/26/01	8260
Allyl Chloride	< 1.0 ug/L	4/26/01	8260
Propionitrile	< 20.0 ug/L	4/26/01	8260
Methacrylonitrile	< 1.0 ug/L	4/26/01	8260
Methyl Acrylate	< 10.0 ug/L	4/26/01	8260
Tetrahydrofuran	< 5.0 ug/L	4/26/01	8260
1-Chlorobutane	< 1.0 ug/L	4/26/01	8260
Chloroacetonitrile	< 25.0 ug/L	4/26/01	8260
2-Nitropropane	< 1.0 ug/L	4/26/01	8260
Methylmethacrylate	< 1.0 ug/L	4/26/01	8260
1,1-Dichloropropanone	< 2.0 ug/L	4/26/01	8260
Ethyl Methacrylate	< 1.0 ug/L	4/26/01	8260
t-1,4-Dichloro-2-butene	< 1.0 ug/L	4/26/01	8260
Pentachloroethane	< 1.0 ug/L	4/26/01	8260
Hexachloroethane	< 1.0 ug/L	4/26/01	8260
Nitrobenzene	< 10.0 ug/L	4/26/01	8260
Dichlorodifluoromethane	< 1.0 ug/L	4/26/01	8260
Trichlorofluoromethane	< 5.0 ug/L	4/26/01	8260
2,2-Dichloropropane	< 1.0 ug/L	4/26/01	8260
Bromochloromethane	< 1.0 ug/L	4/26/01	8260
1,1-Dichloropropene	< 1.0 ug/L	4/26/01	8260
Dibromomethane	< 1.0 ug/L	4/26/01	8260
1,3-Dichloropropane	< 1.0 ug/L	4/26/01	8260
1,2-Dibromoethane	< 1.0 ug/L	4/26/01	8260
1,1,1,2-Tetrachloroethane	< 1.0 ug/L	4/26/01	8260
Isopropylbenzene	< 1.0 ug/L	4/26/01	8260
1,2,3-Trichloropropane	< 1.0 ug/L	4/26/01	8260
n-Propylbenzene	< 1.0 ug/L	4/26/01	8260
Bromobenzene	< 1.0 ug/L	4/26/01	8260
2-Chlorotoluene	< 1.0 ug/L	4/26/01	8260

Page 3  
Lab Number: 01-D1171  
Sample Number: 0119864  
May 2, 2001

Analysis Performed	Results	Analyzed	Method
4-Chlorotoluene	< 1.0 ug/L	4/26/01	8260
1,3,5-Trimethylbenzene	< 1.0 ug/L	4/26/01	8260
tert-Butylbenzene	< 2.0 ug/L	4/26/01	8260
1,2,4-Trimethylbenzene	< 1.0 ug/L	4/26/01	8260
sec-Butylbenzene	< 1.0 ug/L	4/26/01	8260
p-isopropyltoluene	< 1.0 ug/L	4/26/01	8260
n-Butylbenzene	< 1.0 ug/L	4/26/01	8260
1,2-Dibromo-3-Chloroprop	< 1.0 ug/L	4/26/01	8260
1,2,4-Trichlorobenzene	< 5.0 ug/L	4/26/01	8260
Hexachlorobutadiene	< 2.0 ug/L	4/26/01	8260
Naphthalene	< 5.0 ug/L	4/26/01	8260
1,2,3-Trichlorobenzene	< 5.0 ug/L	4/26/01	8260

The analysis of this sample was performed in accordance with procedures approved or recognized by the U.S. Environmental Protection Agency.



Douglas N. Edwards, Acting Director  
Environmental Services Program  
Division of Environmental Quality

c: VALERIE WILDER, HWP

**Analytical Results  
Indoor Air Samples  
Chicago Heights Boulevard VOC Plume Site  
Overland, MO  
April 24, 2001**



STATE OF MISSOURI  
**DEPARTMENT OF NATURAL RESOURCES**  
 DIVISION OF ENVIRONMENTAL QUALITY  
 P.O. Box 176 Jefferson City, MO 65102-0176

Bob Holden, Governor • Stephen M. Mahood, Director

ENVIRONMENTAL SERVICES PROGRAM

RESULTS OF SAMPLE ANALYSES

Sample Number: [REDACTED]  
 Lab Number: 01-D1160

Reported To: BRIAN ALLEN	Report Date: 6/ 8/01
Affiliation: ESP	Date Collected: 4/24/01
LDPR/Job-Project: QEPA4/NJ00CHBD	Date Received: 4/25/01

Sample Collected by: BRIAN ALLEN, ESP  
 Sampling Location: CHICAGO HEIGHT BLVD VOC PLUME  
 Sample Description: 8HR INDOOR AIR SAMPLE COLLECTED  
 FROM RESIDENTIAL [REDACTED]  
 AT [REDACTED] OVERLAND MO  
 County: ST. LOUIS

Analysis Performed	Results	Analyzed	Method
Dichlorodifluoromethane	< 1.5	PPB (V/V) 5/ 4/01	TO-15
1,2-Dichlorotetrafluoreth	< 1.5	PPB (V/V) 5/ 4/01	TO-15
Chloromethane	< 1.5	PPB (V/V) 5/ 4/01	TO-15
Vinyl Chloride	< 1.5	PPB (V/V) 5/ 4/01	TO-15
1,3-Butadiene	< 6.0	PPB (V/V) 5/ 4/01	TO-15
Bromomethane	< 1.5	PPB (V/V) 5/ 4/01	TO-15
Chloroethane	< 1.5	PPB (V/V) 5/ 4/01	TO-15
Trichlorofluoromethane	< 1.5	PPB (V/V) 5/ 4/01	TO-15
1,1,2-Trichlorotrifluoroe	< 1.5	PPB (V/V) 5/ 4/01	TO-15
1,1-Dichloroethene	< 1.5	PPB (V/V) 5/ 4/01	TO-15
Acetone	8.1	PPB (V/V) 5/ 4/01	TO-15
Carbon Disulfide	< 6.0	PPB (V/V) 5/ 4/01	TO-15
Methylene Chloride	< 1.5	PPB (V/V) 5/ 4/01	TO-15
Acrylonitrile	< 6.0	PPB (V/V) 5/ 4/01	TO-15
trans-1,2-Dichloroethene	< 6.0	PPB (V/V) 5/ 4/01	TO-15
Hexane	< 6.0	PPB (V/V) 5/ 4/01	TO-15
2-Butanone	< 6.0	PPB (V/V) 5/ 4/01	TO-15
cis-1,2-Dichloroethene	< 1.5	PPB (V/V) 5/ 4/01	TO-15
Vinyl Acetate	< 6.0	PPB (V/V) 5/ 4/01	TO-15
1,1-Dichloroethane	< 1.5	PPB (V/V) 5/ 4/01	TO-15
1,1,1-Trichloroethane	< 1.5	PPB (V/V) 5/ 4/01	TO-15
Chloroform	< 1.5	PPB (V/V) 5/ 4/01	TO-15

Analysis Performed	Results		Analyzed	Method
1,2-Dichloroethane	< 1.5	PPB (V/V)	5/ 4/01	TO-15
Benzene	2.4	PPB (V/V)	5/ 4/01	TO-15
Carbon Tetrachloride	< 1.5	PPB (V/V)	5/ 4/01	TO-15
Heptane	< 6.0	PPB (V/V)	5/ 4/01	TO-15
1,2-Dichloropropane	< 1.5	PPB (V/V)	5/ 4/01	TO-15
Bromodichloromethane	< 6.0	PPB (V/V)	5/ 4/01	TO-15
Trichloroethene	12	PPB (V/V)	5/ 4/01	TO-15
cis-1,3-Dichloropropene	< 1.5	PPB (V/V)	5/ 4/01	TO-15
4-Methyl-2-Pentanone	< 6.0	PPB (V/V)	5/ 4/01	TO-15
Toluene	9.5	PPB (V/V)	5/ 4/01	TO-15
1,1,2-Trichloroethane	< 1.5	PPB (V/V)	5/ 4/01	TO-15
trans-1,3-Dichloropropene	< 1.5	PPB (V/V)	5/ 4/01	TO-15
Tetrachloroethene	< 1.5	PPB (V/V)	5/ 4/01	TO-15
2-Hexanone	< 6.0	PPB (V/V)	5/ 4/01	TO-15
1,2-Dibromoethane	< 1.5	PPB (V/V)	5/ 4/01	TO-15
Dibromochloromethane	< 6.0	PPB (V/V)	5/ 4/01	TO-15
Chlorobenzene	< 1.5	PPB (V/V)	5/ 4/01	TO-15
Ethylbenzene	< 1.5	PPB (V/V)	5/ 4/01	TO-15
m- & p-xylene	3.8	PPB (V/V)	5/ 4/01	TO-15
o-Xylene	1.5	PPB (V/V)	5/ 4/01	TO-15
Styrene	< 1.5	PPB (V/V)	5/ 4/01	TO-15
Bromoform	< 6.0	PPB (V/V)	5/ 4/01	TO-15
1,3,5-Trimethylbenzene	< 1.5	PPB (V/V)	5/ 4/01	TO-15
1,1,2,2-Tetrachloroethane	< 1.5	PPB (V/V)	5/ 4/01	TO-15
1,2,4-Trimethylbenzene	< 1.5	PPB (V/V)	5/ 4/01	TO-15
1,3-Dichlorobenzene	< 1.5	PPB (V/V)	5/ 4/01	TO-15
1,4-Dichlorobenzene	< 1.5	PPB (V/V)	5/ 4/01	TO-15
Benzyl Chloride	< 1.5	PPB (V/V)	5/ 4/01	TO-15
1,2-Dichlorobenzene	< 1.5	PPB (V/V)	5/ 4/01	TO-15
1,2,4-Trichlorobenzene	< 1.5	PPB (V/V)	5/ 4/01	TO-15
Hexachlorobutadiene	< 1.5	PPB (V/V)	5/ 4/01	TO-15
Propylene	< 6.0	PPB (V/V)	5/ 4/01	TO-15
Vinyl Bromide	< 15	PPB (V/V)	5/ 4/01	TO-15
Isopropyl Alcohol	< 6.0	PPB (V/V)	5/ 4/01	TO-15
Allyl Chloride	< 6.0	PPB (V/V)	5/ 4/01	TO-15
MethylTertiaryButylEther	17	PPB (V/V)	5/ 4/01	TO-15
Ethyl Acetate	< 6.0	PPB (V/V)	5/ 4/01	TO-15
Tetrahydrofuran	< 6.0	PPB (V/V)	5/ 4/01	TO-15
1,4-Dioxane	< 6.0	PPB (V/V)	5/ 4/01	TO-15
Cyclohexane	< 6.0	PPB (V/V)	5/ 4/01	TO-15
Isooctane	< 15	PPB (V/V)	5/ 4/01	TO-15
Ethanol	33	PPB (V/V)	5/ 4/01	TO-15
4-Ethyltoluene	< 6.0	PPB (V/V)	5/ 4/01	TO-15

Page 3  
Lab Number: 01-D1160  
Sample Number: 0119865  
June 8, 2001

Sample Comments:  
Analyzed by Air Toxics LTD.

The analysis of this sample was performed in accordance with procedures approved or recognized by the U.S. Environmental Protection Agency.



Douglas N. Edwards, Acting Director  
Environmental Services Program  
Division of Environmental Quality

c: VALERIE WILDER, HWP

STATE OF MISSOURI  
**DEPARTMENT OF NATURAL RESOURCES**

Bob Holden, Governor • Stephen M. Mahfood, Director

DIVISION OF ENVIRONMENTAL QUALITY  
 P.O. Box 176 Jefferson City, MO 65102-0176

ENVIRONMENTAL SERVICES PROGRAM

RESULTS OF SAMPLE ANALYSES

Sample Number: [REDACTED]  
 Lab Number: 01-D1161

**RECEIVED**  
**JUN 28 2001**  
 HAZARDOUS WASTE PROGRAM  
 MISSOURI DEPARTMENT OF  
 NATURAL RESOURCES

Reported To: BRIAN ALLEN  
 Affiliation: ESP  
 LDPR/Job-Project: QEPA4/NJ00CHBD  
 Report Date: 6/21/01  
 Date Collected: 4/24/01  
 Date Received: 4/25/01

Sample Collected by: BRIAN ALLEN, ESP  
 Sampling Location: CHICAGO HEIGHT BLVD VOC PLUME  
 Sample Description: 8HR INDOOR AIR SAMPLE COLLECTED  
 FROM RESIDENTIAL BASEMENT  
 AT [REDACTED] PL OVERLAND MO  
 County: ST. LOUIS

Analysis Performed	Results	Analyzed	Method
Dichlorodifluoromethane	< 1.2	PPB (V/V) 5/ 4/01	TO-15
1,2-Dichlorotetrafluoreth	< 1.2	PPB (V/V) 5/ 4/01	TO-15
Chloromethane	< 1.2	PPB (V/V) 5/ 4/01	TO-15
Vinyl Chloride	< 1.2	PPB (V/V) 5/ 4/01	TO-15
1,3-Butadiene	< 4.6	PPB (V/V) 5/ 4/01	TO-15
Bromomethane	< 1.2	PPB (V/V) 5/ 4/01	TO-15
Chloroethane	< 1.2	PPB (V/V) 5/ 4/01	TO-15
Trichlorofluoromethane	< 1.2	PPB (V/V) 5/ 4/01	TO-15
1,1,2-Trichlorotrifluoroe	< 1.2	PPB (V/V) 5/ 4/01	TO-15
1,1-Dichloroethene	< 1.2	PPB (V/V) 5/ 4/01	TO-15
Acetone	< 4.6	PPB (V/V) 5/ 4/01	TO-15
Carbon Disulfide	< 4.6	PPB (V/V) 5/ 4/01	TO-15
Methylene Chloride	11	PPB (V/V) 5/ 4/01	TO-15
Acrylonitrile	< 4.6	PPB (V/V) 5/ 4/01	TO-15
trans-1,2-Dichloroethene	< 4.6	PPB (V/V) 5/ 4/01	TO-15
Hexane	9.4	PPB (V/V) 5/ 4/01	TO-15
2-Butanone	< 4.6	PPB (V/V) 5/ 4/01	TO-15
cis-1,2-Dichloroethene	< 1.2	PPB (V/V) 5/ 4/01	TO-15
Vinyl Acetate	< 4.6	PPB (V/V) 5/ 4/01	TO-15
1,1-Dichloroethane	< 1.2	PPB (V/V) 5/ 4/01	TO-15
1,1,1-Trichloroethane	< 1.2	PPB (V/V) 5/ 4/01	TO-15
Chloroform	< 1.2	PPB (V/V) 5/ 4/01	TO-15

Analysis Performed	Results		Analyzed	Method
1,2-Dichloroethane	< 1.2	PPB (V/V)	5/ 4/01	TO-15
Benzene	2.6	PPB (V/V)	5/ 4/01	TO-15
Carbon Tetrachloride	< 1.2	PPB (V/V)	5/ 4/01	TO-15
Heptane	< 4.6	PPB (V/V)	5/ 4/01	TO-15
1,2-Dichloropropane	< 1.2	PPB (V/V)	5/ 4/01	TO-15
Bromodichloromethane	< 4.6	PPB (V/V)	5/ 4/01	TO-15
Trichloroethene	< 1.2	PPB (V/V)	5/ 4/01	TO-15
cis-1,3-Dichloropropene	< 1.2	PPB (V/V)	5/ 4/01	TO-15
4-Methyl-2-Pentanone	< 4.6	PPB (V/V)	5/ 4/01	TO-15
Toluene	15	PPB (V/V)	5/ 4/01	TO-15
1,1,2-Trichloroethane	< 1.2	PPB (V/V)	5/ 4/01	TO-15
trans-1,3-Dichloropropene	< 1.2	PPB (V/V)	5/ 4/01	TO-15
Tetrachloroethene	< 1.2	PPB (V/V)	5/ 4/01	TO-15
2-Hexanone	< 4.6	PPB (V/V)	5/ 4/01	TO-15
1,2-Dibromoethane	< 1.2	PPB (V/V)	5/ 4/01	TO-15
Dibromochloromethane	< 4.6	PPB (V/V)	5/ 4/01	TO-15
Chlorobenzene	< 1.2	PPB (V/V)	5/ 4/01	TO-15
Ethylbenzene	2.3	PPB (V/V)	5/ 4/01	TO-15
m- & p-xylene	8.5	PPB (V/V)	5/ 4/01	TO-15
o-Xylene	3.9	PPB (V/V)	5/ 4/01	TO-15
Styrene	< 1.2	PPB (V/V)	5/ 4/01	TO-15
Bromoform	< 4.6	PPB (V/V)	5/ 4/01	TO-15
1,3,5-Trimethylbenzene	< 1.2	PPB (V/V)	5/ 4/01	TO-15
1,1,2,2-Tetrachloroethane	< 1.2	PPB (V/V)	5/ 4/01	TO-15
1,2,4-Trimethylbenzene	2.9	PPB (V/V)	5/ 4/01	TO-15
1,3-Dichlorobenzene	< 1.2	PPB (V/V)	5/ 4/01	TO-15
1,4-Dichlorobenzene	< 1.2	PPB (V/V)	5/ 4/01	TO-15
Benzyl Chloride	< 1.2	PPB (V/V)	5/ 4/01	TO-15
1,2-Dichlorobenzene	< 1.2	PPB (V/V)	5/ 4/01	TO-15
1,2,4-Trichlorobenzene	< 1.2	PPB (V/V)	5/ 4/01	TO-15
Hexachlorobutadiene	< 1.2	PPB (V/V)	5/ 4/01	TO-15
Propylene	< 4.6	PPB (V/V)	5/ 4/01	TO-15
Vinyl Bromide	< 12	PPB (V/V)	5/ 4/01	TO-15
Isopropyl Alcohol	89	PPB (V/V)	5/ 4/01	TO-15
Allyl Chloride	< 4.6	PPB (V/V)	5/ 4/01	TO-15
MethylTertiaryButylEther	30	PPB (V/V)	5/ 4/01	TO-15
Ethyl Acetate	< 4.6	PPB (V/V)	5/ 4/01	TO-15
Tetrahydrofuran	< 4.6	PPB (V/V)	5/ 4/01	TO-15
1,4-Dioxane	< 4.6	PPB (V/V)	5/ 4/01	TO-15
Cyclohexane	< 4.6	PPB (V/V)	5/ 4/01	TO-15
Isooctane	< 12	PPB (V/V)	5/ 4/01	TO-15
Ethanol	33	PPB (V/V)	5/ 4/01	TO-15
4-Ethyltoluene	2.7	PPB (V/V)	5/ 4/01	TO-15

Page 3  
Lab Number: 01-D1161  
Sample Number: 0119866  
June 21, 2001

Sample Comments:  
Analyzed by Air Toxics LTD.

The analysis of this sample was performed in accordance with procedures approved or recognized by the U.S. Environmental Protection Agency.

*Connie Hising*

Douglas N. Edwards, Acting Director  
Environmental Services Program  
Division of Environmental Quality

c: VALERIE WILDER, HWP

STATE OF MISSOURI  
**DEPARTMENT OF NATURAL RESOURCES**

Bob Holden, Governor • Stephen M. Mahfood, Director

DIVISION OF ENVIRONMENTAL QUALITY  
 P.O. Box 176 Jefferson City, MO 65102-0176

**RECEIVED**

ENVIRONMENTAL SERVICES PROGRAM

RESULTS OF SAMPLE ANALYSES

**JUN 28 2001**

Sample Number: [REDACTED]  
 Lab Number: 01-D1162

HAZARDOUS WASTE PROGRAM  
 MISSOURI DEPARTMENT OF  
 NATURAL RESOURCES

Reported To: BRIAN ALLEN  
 Affiliation: ESP  
 LDPR/Job-Project: QEPA4/NJ00CHBD

Report Date: 6/21/01  
 Date Collected: 4/24/01  
 Date Received: 4/25/01

Sample Collected by: BRIAN ALLEN, ESP  
 Sampling Location: CHICAGO HEIGHT BLVD VOC PLUME  
 Sample Description: 8HR INDOOR AIR SAMPLE COLLECTED  
 FROM RESIDENTIAL BASEMENT  
 AT [REDACTED] PL OVERLAND MO  
 County: ST. LOUIS

Analysis Performed	Results	Analyzed	Method
Dichlorodifluoromethane	< 1.2	PPB (V/V) 5/ 4/01	TO-15
1,2-Dichlorotetrafluoreth	< 1.2	PPB (V/V) 5/ 4/01	TO-15
Chloromethane	< 1.2	PPB (V/V) 5/ 4/01	TO-15
Vinyl Chloride	< 1.2	PPB (V/V) 5/ 4/01	TO-15
1,3-Butadiene	< 4.6	PPB (V/V) 5/ 4/01	TO-15
Bromomethane	< 1.2	PPB (V/V) 5/ 4/01	TO-15
Chloroethane	< 1.2	PPB (V/V) 5/ 4/01	TO-15
Trichlorofluoromethane	1.7	PPB (V/V) 5/ 4/01	TO-15
1,1,2-Trichlorotrifluoroe	< 1.2	PPB (V/V) 5/ 4/01	TO-15
1,1-Dichloroethene	< 1.2	PPB (V/V) 5/ 4/01	TO-15
Acetone	20	PPB (V/V) 5/ 4/01	TO-15
Carbon Disulfide	< 4.6	PPB (V/V) 5/ 4/01	TO-15
Methylene Chloride	< 1.2	PPB (V/V) 5/ 4/01	TO-15
Acrylonitrile	< 4.6	PPB (V/V) 5/ 4/01	TO-15
trans-1,2-Dichloroethene	< 4.6	PPB (V/V) 5/ 4/01	TO-15
Hexane	< 4.6	PPB (V/V) 5/ 4/01	TO-15
2-Butanone	< 4.6	PPB (V/V) 5/ 4/01	TO-15
cis-1,2-Dichloroethene	8.6	PPB (V/V) 5/ 4/01	TO-15
Vinyl Acetate	< 4.6	PPB (V/V) 5/ 4/01	TO-15
1,1-Dichloroethane	< 1.2	PPB (V/V) 5/ 4/01	TO-15
1,1,1-Trichloroethane	< 1.2	PPB (V/V) 5/ 4/01	TO-15
Chloroform	< 1.2	PPB (V/V) 5/ 4/01	TO-15

Analysis Performed	Results		Analyzed	Method
1,2-Dichloroethane	< 1.2	PPB (V/V)	5/ 4/01	TO-15
Benzene	< 1.2	PPB (V/V)	5/ 4/01	TO-15
Carbon Tetrachloride	< 1.2	PPB (V/V)	5/ 4/01	TO-15
Heptane	< 4.6	PPB (V/V)	5/ 4/01	TO-15
1,2-Dichloropropane	< 1.2	PPB (V/V)	5/ 4/01	TO-15
Bromodichloromethane	< 4.6	PPB (V/V)	5/ 4/01	TO-15
Trichloroethene	12	PPB (V/V)	5/ 4/01	TO-15
cis-1,3-Dichloropropene	< 1.2	PPB (V/V)	5/ 4/01	TO-15
4-Methyl-2-Pentanone	< 4.6	PPB (V/V)	5/ 4/01	TO-15
Toluene	4.1	PPB (V/V)	5/ 4/01	TO-15
1,1,2-Trichloroethane	< 1.2	PPB (V/V)	5/ 4/01	TO-15
trans-1,3-Dichloropropene	< 1.2	PPB (V/V)	5/ 4/01	TO-15
Tetrachloroethene	< 1.2	PPB (V/V)	5/ 4/01	TO-15
2-Hexanone	< 4.6	PPB (V/V)	5/ 4/01	TO-15
1,2-Dibromoethane	< 1.2	PPB (V/V)	5/ 4/01	TO-15
Dibromochloromethane	< 4.6	PPB (V/V)	5/ 4/01	TO-15
Chlorobenzene	< 1.2	PPB (V/V)	5/ 4/01	TO-15
Ethylbenzene	< 1.2	PPB (V/V)	5/ 4/01	TO-15
m- & p-xylene	1.6	PPB (V/V)	5/ 4/01	TO-15
o-Xylene	< 1.2	PPB (V/V)	5/ 4/01	TO-15
Styrene	< 1.2	PPB (V/V)	5/ 4/01	TO-15
Bromoform	< 4.6	PPB (V/V)	5/ 4/01	TO-15
1,3,5-Trimethylbenzene	< 1.2	PPB (V/V)	5/ 4/01	TO-15
1,1,2,2-Tetrachloroethane	< 1.2	PPB (V/V)	5/ 4/01	TO-15
1,2,4-Trimethylbenzene	< 1.2	PPB (V/V)	5/ 4/01	TO-15
1,3-Dichlorobenzene	< 1.2	PPB (V/V)	5/ 4/01	TO-15
1,4-Dichlorobenzene	9.0	PPB (V/V)	5/ 4/01	TO-15
Benzyl Chloride	< 1.2	PPB (V/V)	5/ 4/01	TO-15
1,2-Dichlorobenzene	< 1.2	PPB (V/V)	5/ 4/01	TO-15
1,2,4-Trichlorobenzene	< 1.2	PPB (V/V)	5/ 4/01	TO-15
Hexachlorobutadiene	< 1.2	PPB (V/V)	5/ 4/01	TO-15
Propylene	< 4.6	PPB (V/V)	5/ 4/01	TO-15
Vinyl Bromide	< 12	PPB (V/V)	5/ 4/01	TO-15
Isopropyl Alcohol	35	PPB (V/V)	5/ 4/01	TO-15
Allyl Chloride	< 4.6	PPB (V/V)	5/ 4/01	TO-15
MethylTertiaryButylEther	< 4.6	PPB (V/V)	5/ 4/01	TO-15
Ethyl Acetate	16	PPB (V/V)	5/ 4/01	TO-15
Tetrahydrofuran	< 4.6	PPB (V/V)	5/ 4/01	TO-15
1,4-Dioxane	< 4.6	PPB (V/V)	5/ 4/01	TO-15
Cyclohexane	< 4.6	PPB (V/V)	5/ 4/01	TO-15
Isooctane	< 12	PPB (V/V)	5/ 4/01	TO-15
Ethanol	180	PPB (V/V)	5/ 4/01	TO-15
4-Ethyltoluene	< 4.6	PPB (V/V)	5/ 4/01	TO-15

Page 3  
Lab Number: 01-D1162  
Sample Number: 0119867  
June 21, 2001

Sample Comments:  
Analyzed by Air Toxics LTD.

The analysis of this sample was performed in accordance with procedures approved or recognized by the U.S. Environmental Protection Agency.

*Connie Hising*  
*for*

Douglas N. Edwards, Acting Director  
Environmental Services Program  
Division of Environmental Quality

c: VALERIE WILDER, HWP

STATE OF MISSOURI  
**DEPARTMENT OF NATURAL RESOURCES**

Bob Holden, Governor • Stephen M. Mahford, Director

DIVISION OF ENVIRONMENTAL QUALITY  
 P.O. Box 176 Jefferson City, MO 65102-0176

ENVIRONMENTAL SERVICES PROGRAM

RESULTS OF SAMPLE ANALYSES

Sample Number: [REDACTED]  
 Lab Number: 01-D1163

RECEIVED  
 JUN 29 2001  
 HAZARDOUS WASTE PROGRAM  
 MISSOURI DEPARTMENT OF  
 NATURAL RESOURCES

Reported To: BRIAN ALLEN  
 Affiliation: ESP  
 LDPR/Job-Project: QEPA4/NJ00CHBD

Report Date: 6/21/01  
 Date Collected: 4/24/01  
 Date Received: 4/25/01

Sample Collected by: BRIAN ALLEN, ESP  
 Sampling Location: CHICAGO HEIGHT BLVD VOC PLUME  
 Sample Description: 8HR INDOOR AIR SAMPLE COLLECTED  
 FROM RESIDENTIAL [REDACTED]  
 AT [REDACTED] OVERLAND MO  
 County: ST. LOUIS

Analysis Performed	Results	Analyzed	Method
Dichlorodifluoromethane	< 1.1	PPB (V/V) 5/ 4/01	TO-15
1,2-Dichlorotetrafluoreth	< 1.1	PPB (V/V) 5/ 4/01	TO-15
Chloromethane	< 1.1	PPB (V/V) 5/ 4/01	TO-15
Vinyl Chloride	< 1.1	PPB (V/V) 5/ 4/01	TO-15
1,3-Butadiene	< 4.5	PPB (V/V) 5/ 4/01	TO-15
Bromomethane	< 1.1	PPB (V/V) 5/ 4/01	TO-15
Chloroethane	< 1.1	PPB (V/V) 5/ 4/01	TO-15
Trichlorofluoromethane	1.3	PPB (V/V) 5/ 4/01	TO-15
1,1,2-Trichlorotrifluoroe	< 1.1	PPB (V/V) 5/ 4/01	TO-15
1,1-Dichloroethene	< 1.1	PPB (V/V) 5/ 4/01	TO-15
Acetone	110	PPB (V/V) 5/ 4/01	TO-15
Carbon Disulfide	< 4.5	PPB (V/V) 5/ 4/01	TO-15
Methylene Chloride	< 1.1	PPB (V/V) 5/ 4/01	TO-15
Acrylonitrile	< 4.5	PPB (V/V) 5/ 4/01	TO-15
trans-1,2-Dichloroethene	< 4.5	PPB (V/V) 5/ 4/01	TO-15
Hexane	9.2	PPB (V/V) 5/ 4/01	TO-15
2-Butanone	< 4.5	PPB (V/V) 5/ 4/01	TO-15
cis-1,2-Dichloroethene	< 1.1	PPB (V/V) 5/ 4/01	TO-15
Vinyl Acetate	< 4.5	PPB (V/V) 5/ 4/01	TO-15
1,1-Dichloroethane	< 1.1	PPB (V/V) 5/ 4/01	TO-15
1,1,1-Trichloroethane	< 1.1	PPB (V/V) 5/ 4/01	TO-15
Chloroform	< 1.1	PPB (V/V) 5/ 4/01	TO-15

Analysis Performed	Results		Analyzed	Method
1,2-Dichloroethane	< 1.1	PPB (V/V)	5/ 4/01	TO-15
Benzene	2.1	PPB (V/V)	5/ 4/01	TO-15
Carbon Tetrachloride	< 1.1	PPB (V/V)	5/ 4/01	TO-15
Heptane	5.0	PPB (V/V)	5/ 4/01	TO-15
1,2-Dichloropropane	< 1.1	PPB (V/V)	5/ 4/01	TO-15
Bromodichloromethane	< 4.5	PPB (V/V)	5/ 4/01	TO-15
Trichloroethene	< 1.1	PPB (V/V)	5/ 4/01	TO-15
cis-1,3-Dichloropropene	< 1.1	PPB (V/V)	5/ 4/01	TO-15
4-Methyl-2-Pentanone	< 4.5	PPB (V/V)	5/ 4/01	TO-15
Toluene	5.0	PPB (V/V)	5/ 4/01	TO-15
1,1,2-Trichloroethane	< 1.1	PPB (V/V)	5/ 4/01	TO-15
trans-1,3-Dichloropropene	< 1.1	PPB (V/V)	5/ 4/01	TO-15
Tetrachloroethene	< 1.1	PPB (V/V)	5/ 4/01	TO-15
2-Hexanone	< 4.5	PPB (V/V)	5/ 4/01	TO-15
1,2-Dibromoethane	< 1.1	PPB (V/V)	5/ 4/01	TO-15
Dibromochloromethane	< 4.5	PPB (V/V)	5/ 4/01	TO-15
Chlorobenzene	< 1.1	PPB (V/V)	5/ 4/01	TO-15
Ethylbenzene	< 1.1	PPB (V/V)	5/ 4/01	TO-15
m- & p-xylene	1.4	PPB (V/V)	5/ 4/01	TO-15
o-Xylene	< 1.1	PPB (V/V)	5/ 4/01	TO-15
Styrene	< 1.1	PPB (V/V)	5/ 4/01	TO-15
Bromoform	< 4.5	PPB (V/V)	5/ 4/01	TO-15
1,3,5-Trimethylbenzene	< 1.1	PPB (V/V)	5/ 4/01	TO-15
1,1,2,2-Tetrachloroethane	< 1.1	PPB (V/V)	5/ 4/01	TO-15
1,2,4-Trimethylbenzene	< 1.1	PPB (V/V)	5/ 4/01	TO-15
1,3-Dichlorobenzene	< 1.1	PPB (V/V)	5/ 4/01	TO-15
1,4-Dichlorobenzene	< 1.1	PPB (V/V)	5/ 4/01	TO-15
Benzyl Chloride	< 1.1	PPB (V/V)	5/ 4/01	TO-15
1,2-Dichlorobenzene	< 1.1	PPB (V/V)	5/ 4/01	TO-15
1,2,4-Trichlorobenzene	< 1.1	PPB (V/V)	5/ 4/01	TO-15
Hexachlorobutadiene	< 1.1	PPB (V/V)	5/ 4/01	TO-15
Propylene	< 4.5	PPB (V/V)	5/ 4/01	TO-15
Vinyl Bromide	< 11	PPB (V/V)	5/ 4/01	TO-15
Isopropyl Alcohol	380	PPB (V/V)	5/ 4/01	TO-15
Allyl Chloride	< 4.5	PPB (V/V)	5/ 4/01	TO-15
MethylTertiaryButylEther	< 4.5	PPB (V/V)	5/ 4/01	TO-15
Ethyl Acetate	5.5	PPB (V/V)	5/ 4/01	TO-15
Tetrahydrofuran	< 4.5	PPB (V/V)	5/ 4/01	TO-15
1,4-Dioxane	< 4.5	PPB (V/V)	5/ 4/01	TO-15
Cyclohexane	4.8	PPB (V/V)	5/ 4/01	TO-15
Isooctane	< 11	PPB (V/V)	5/ 4/01	TO-15
Ethanol	200	PPB (V/V)	5/ 4/01	TO-15
4-Ethyltoluene	< 4.5	PPB (V/V)	5/ 4/01	TO-15

: Page 3  
Lab Number: 01-D1163  
Sample Number: 0119868  
June 21, 2001

Sample Comments:  
Analyzed by Air Toxics LTD.

The analysis of this sample was performed in accordance with procedures approved or recognized by the U.S. Environmental Protection Agency.

*Connie Husing*

Douglas N. Edwards, Acting Director  
Environmental Services Program  
Division of Environmental Quality

c: VALERIE WILDER, HWP



STATE OF MISSOURI  
**DEPARTMENT OF NATURAL RESOURCES**

Bob Holden, Governor • Stephen M. Mahfood, Director

DIVISION OF ENVIRONMENTAL QUALITY  
 P.O. Box 176 Jefferson City, MO 65102-0176

ENVIRONMENTAL SERVICES PROGRAM

RESULTS OF SAMPLE ANALYSES

Sample Number: [REDACTED]  
 Lab Number: 01-D1164

RECEIVED  
 JUN 26 2001

HAZARDOUS WASTE PROGRAM  
 MISSOURI DEPARTMENT OF  
 NATURAL RESOURCES

Reported To: BRIAN ALLEN Report Date: 6/21/01  
 Affiliation: ESP Date Collected: 4/24/01  
 LDPR/Job-Project: QEPA4/NJ00CHBD Date Received: 4/25/01

Sample Collected by: BRIAN ALLEN, ESP  
 Sampling Location: CHICAGO HEIGHT BLVD VOC PLUME  
 Sample Description: 8HR INDOOR AIR SAMPLE COLLECTED  
 FROM RESIDENTIAL [REDACTED]  
 AT [REDACTED] OVERLAND MO  
 County: ST. LOUIS

Analysis Performed	Results	Unit	Analyzed	Method
Dichlorodifluoromethane	< 1.2	PPB (V/V)	5/14/01	TO-15
1,2-Dichlorotetrafluoreth	< 1.2	PPB (V/V)	5/14/01	TO-15
Chloromethane	< 1.2	PPB (V/V)	5/14/01	TO-15
Vinyl Chloride	< 1.2	PPB (V/V)	5/14/01	TO-15
1,3-Butadiene	< 4.6	PPB (V/V)	5/14/01	TO-15
Bromomethane	< 1.2	PPB (V/V)	5/14/01	TO-15
Chloroethane	< 1.2	PPB (V/V)	5/14/01	TO-15
Trichlorofluoromethane	< 1.2	PPB (V/V)	5/14/01	TO-15
1,1,2-Trichlorotrifluoroe	< 1.2	PPB (V/V)	5/14/01	TO-15
1,1-Dichloroethene	< 1.2	PPB (V/V)	5/14/01	TO-15
Acetone	17	PPB (V/V)	5/14/01	TO-15
Carbon Disulfide	< 4.6	PPB (V/V)	5/14/01	TO-15
Methylene Chloride	1.4	PPB (V/V)	5/14/01	TO-15
Acrylonitrile	< 4.6	PPB (V/V)	5/14/01	TO-15
trans-1,2-Dichloroethene	< 4.6	PPB (V/V)	5/14/01	TO-15
Hexane	< 4.6	PPB (V/V)	5/14/01	TO-15
2-Butanone	< 4.6	PPB (V/V)	5/14/01	TO-15
cis-1,2-Dichloroethene	< 1.2	PPB (V/V)	5/14/01	TO-15
Vinyl Acetate	< 4.6	PPB (V/V)	5/14/01	TO-15
1,1-Dichloroethane	< 1.2	PPB (V/V)	5/14/01	TO-15
1,1,1-Trichloroethane	< 1.2	PPB (V/V)	5/14/01	TO-15
Chloroform	< 1.2	PPB (V/V)	5/14/01	TO-15

Analysis Performed	Results		Analyzed	Method
1,2-Dichloroethane	< 1.2	PPB (V/V)	5/14/01	TO-15
Benzene	< 1.2	PPB (V/V)	5/14/01	TO-15
Carbon Tetrachloride	< 1.2	PPB (V/V)	5/14/01	TO-15
Heptane	< 4.6	PPB (V/V)	5/14/01	TO-15
1,2-Dichloropropane	< 1.2	PPB (V/V)	5/14/01	TO-15
Bromodichloromethane	< 4.6	PPB (V/V)	5/14/01	TO-15
Trichloroethene	< 1.2	PPB (V/V)	5/14/01	TO-15
cis-1,3-Dichloropropene	< 1.2	PPB (V/V)	5/14/01	TO-15
4-Methyl-2-Pentanone	< 4.6	PPB (V/V)	5/14/01	TO-15
Toluene	3.2	PPB (V/V)	5/14/01	TO-15
1,1,2-Trichloroethane	< 1.2	PPB (V/V)	5/14/01	TO-15
trans-1,3-Dichloropropene	< 1.2	PPB (V/V)	5/14/01	TO-15
Tetrachloroethene	< 1.2	PPB (V/V)	5/14/01	TO-15
2-Hexanone	< 4.6	PPB (V/V)	5/14/01	TO-15
1,2-Dibromoethane	< 1.2	PPB (V/V)	5/14/01	TO-15
Dibromochloromethane	< 4.6	PPB (V/V)	5/14/01	TO-15
Chlorobenzene	< 1.2	PPB (V/V)	5/14/01	TO-15
Ethylbenzene	< 1.2	PPB (V/V)	5/14/01	TO-15
m- & p-xylene	< 1.2	PPB (V/V)	5/14/01	TO-15
o-Xylene	< 1.2	PPB (V/V)	5/14/01	TO-15
Styrene	< 1.2	PPB (V/V)	5/14/01	TO-15
Bromoform	< 4.6	PPB (V/V)	5/14/01	TO-15
1,3,5-Trimethylbenzene	< 1.2	PPB (V/V)	5/14/01	TO-15
1,1,2,2-Tetrachloroethane	< 1.2	PPB (V/V)	5/14/01	TO-15
1,2,4-Trimethylbenzene	< 1.2	PPB (V/V)	5/14/01	TO-15
1,3-Dichlorobenzene	< 1.2	PPB (V/V)	5/14/01	TO-15
1,4-Dichlorobenzene	< 1.2	PPB (V/V)	5/14/01	TO-15
Benzyl Chloride	< 1.2	PPB (V/V)	5/14/01	TO-15
1,2-Dichlorobenzene	< 1.2	PPB (V/V)	5/14/01	TO-15
1,2,4-Trichlorobenzene	< 1.2	PPB (V/V)	5/14/01	TO-15
Hexachlorobutadiene	< 1.2	PPB (V/V)	5/14/01	TO-15
Propylene	< 4.6	PPB (V/V)	5/14/01	TO-15
Vinyl Bromide	< 12	PPB (V/V)	5/14/01	TO-15
Isopropyl Alcohol	< 4.6	PPB (V/V)	5/14/01	TO-15
Allyl Chloride	< 4.6	PPB (V/V)	5/14/01	TO-15
MethylTertiaryButylEther	< 4.6	PPB (V/V)	5/14/01	TO-15
Ethyl Acetate	< 4.6	PPB (V/V)	5/14/01	TO-15
Tetrahydrofuran	< 4.6	PPB (V/V)	5/14/01	TO-15
1,4-Dioxane	< 4.6	PPB (V/V)	5/14/01	TO-15
Cyclohexane	< 4.6	PPB (V/V)	5/14/01	TO-15
Isooctane	< 12	PPB (V/V)	5/14/01	TO-15
Ethanol	17	PPB (V/V)	5/14/01	TO-15
4-Ethyltoluene	< 4.6	PPB (V/V)	5/14/01	TO-15

Page 3  
Lab Number: 01-D1164  
Sample Number: 0119869  
June 21, 2001

Sample Comments:  
Analyzed by Air Toxics LTD.

The analysis of this sample was performed in accordance with procedures approved or recognized by the U.S. Environmental Protection Agency.

*Connie Giesing*  
*DFW*

Douglas N. Edwards, Acting Director  
Environmental Services Program  
Division of Environmental Quality

c: VALERIE WILDER, HWP

**Preliminary Results  
Indoor Air Samples**

# @ AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

**WORK ORDER #: 0105019**

**Work Order Summary**

<b>CLIENT:</b>	Mr. Brian Allen Missouri Department of Natural Resources 2710 West Main Jefferson City, MO 65109	<b>BILL TO:</b>	Ms. Angela Pemberton Missouri Department of Natural Resources 2710 West Main Jefferson City, MO 65109
<b>PHONE:</b>	573-526-3363	<b>P.O. #</b>	791111496
<b>FAX:</b>	573-526-3350	<b>PROJECT #</b>	NJ00CHBD
<b>DATE RECEIVED:</b>	5/1/01		
<b>DATE COMPLETED:</b>	5/15/01		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT YAC/PRES.</u>
01A	0119865	TO-15	16.5 "Hg
02A	0119866	TO-15	12.5 "Hg
03A	0119867	TO-15	12.5 "Hg
04A	0119868	TO-15	12.0 "Hg
05A	0119869	TO-15	12.5 "Hg
06A	Lab Blank	TO-15	NA

CERTIFIED BY:

*Sandra D. Freeman*

Laboratory Director

DATE: 05/15/01

Certification numbers: CA ELAP - 1149, NY ELAP - 11291, UT ELAP - E-217, AZ ELAP - AZ0567

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630  
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

**LABORATORY NARRATIVE**  
**TO-15**  
**State of Missouri, Dept. of Natural Resources**  
**Workorder# 0105019**

Five 6 Liter Summa Canister samples were received on May 01, 2001. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode. The method involves concentrating to 0.5 liters of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis. See the data sheets for the reporting limits for each compound.

During the five point calibration, two low-level standards are used. The low-level standard for TO-15 compounds is spiked at 0.5 ppbv and represents the reporting limit for these compounds. The low-level standard for the non-TO-15 compounds is spiked at 2.0 ppbv and represents the reporting limit for these compounds. The TO-15 compounds are present in both standards but are excluded from reporting in the 2.0 ppbv standard since a lower level is already included in the curve.

Method modifications taken to run these samples include:

<i>Requirement</i>	<i>TO-15</i>	<i>ATL Modifications</i>
Dilutions for internal calibration.	Dynamic or static dilutions using canisters.	Syringe and flow controller dilutions.
Internal standard recoveries.	Not specified.	Within 40% of the daily CCV internal standard area for blanks and samples.
Internal standard retention times.	Not specified.	Within 0.50 minutes of most recent daily CCV internal standards
Internal calibration criteria.	Not specified.	RSD of 30% or less for standard compounds, 40% or less for non-standard and polar compounds.
Continuing calibration verification criteria	Not specified.	70 - 130% for at least 90% of standard compounds, 60 - 140% for at least 80% of non-standard and polar compounds
Response factor for quantitation.	Average response factor (ICAL).	Average response factor (ICAL).

**Receiving Notes**

Sample 0119865 was received with significant vacuum remaining in the canister. The client was contacted and analysis proceeded. The residual canister vacuum resulted in elevated reporting limits.

**Analytical Notes**

There were no analytical discrepancies.

**Definition of Data Qualifying Flags**

Seven qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

**S - Saturated Peak.**

**Q - Exceeds quality control limits.**

**U - Compound analyzed for but not detected above the reporting limit.**

**N - The identification is based on presumptive evidence.**

# AIR TOXICS LTD.

SAMPLE NAME: 0119865

ID#: XXXXXXXXXX

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	c050411	Date of Collection: 4/24/01
DIL Factor:	2.98	Date of Analysis: 5/4/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	1.5	7.5	Not Detected	Not Detected
Freon 114	1.5	10	Not Detected	Not Detected
Chloromethane	1.5	3.1	Not Detected	Not Detected
Vinyl Chloride	1.5	3.9	Not Detected	Not Detected
Bromomethane	1.5	5.9	Not Detected	Not Detected
Chloroethane	1.5	4.0	Not Detected	Not Detected
Freon 11	1.5	8.5	Not Detected	Not Detected
1,1-Dichloroethane	1.5	6.0	Not Detected	Not Detected
Freon 113	1.5	12	Not Detected	Not Detected
Methylene Chloride	1.5	5.3	Not Detected	Not Detected
1,1-Dichloroethane	1.5	6.1	Not Detected	Not Detected
cis-1,2-Dichloroethane	1.5	6.0	Not Detected	Not Detected
Chloroform	1.5	7.4	Not Detected	Not Detected
1,1,1-Trichloroethane	1.5	8.3	Not Detected	Not Detected
Carbon Tetrachloride	1.5	9.5	Not Detected	Not Detected
Benzene	1.5	4.8	2.4	7.8
1,2-Dichloroethane	1.5	6.1	Not Detected	Not Detected
Trichloroethane	1.5	8.1	12	67
1,2-Dichloropropane	1.5	7.0	Not Detected	Not Detected
cis-1,3-Dichloropropene	1.5	6.9	Not Detected	Not Detected
Toluene	1.5	5.7	9.5	36
trans-1,3-Dichloropropene	1.5	6.9	Not Detected	Not Detected
1,1,2-Trichloroethane	1.5	8.3	Not Detected	Not Detected
Tetrachloroethane	1.5	10	Not Detected	Not Detected
Ethylene Dibromide	1.5	12	Not Detected	Not Detected
Chlorobenzene	1.5	7.0	Not Detected	Not Detected
Ethyl Benzene	1.5	6.6	Not Detected	Not Detected
m,p-Xylene	1.5	6.6	3.8	17
o-Xylene	1.5	6.6	1.5	6.7
Styrene	1.5	6.4	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	1.5	10	Not Detected	Not Detected
1,3,5-Trimethylbenzene	1.5	7.4	Not Detected	Not Detected
1,2,4-Trimethylbenzene	1.5	7.4	Not Detected	Not Detected
1,3-Dichlorobenzene	1.5	9.1	Not Detected	Not Detected
1,4-Dichlorobenzene	1.5	9.1	Not Detected	Not Detected
Chlorotoluene	1.5	7.8	Not Detected	Not Detected
1,2-Dichlorobenzene	1.5	9.1	Not Detected	Not Detected
1,2,4-Trichlorobenzene	1.5	11	Not Detected	Not Detected
Hexachlorobutadiene	1.5	16	Not Detected	Not Detected
Propylene	6.0	10	Not Detected	Not Detected
1,3-Butadiene	6.0	13	Not Detected	Not Detected
Acetone	6.0	14	8.1	20

**AIR TOXICS LTD.**

SAMPLE NAME: 0119865

ID#: [REDACTED]

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	c050411	Date of Collection:	4/24/01
Dil. Factor:	2.88	Date of Analysis:	5/4/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Carbon Disulfide	6.0	19	Not Detected	Not Detected
2-Propanol	6.0	15	Not Detected	Not Detected
trans-1,2-Dichloroethene	6.0	24	Not Detected	Not Detected
Vinyl Acetate	6.0	21	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	6.0	18	Not Detected	Not Detected
Hexane	6.0	21	Not Detected	Not Detected
Tetrahydrofuran	6.0	18	Not Detected	Not Detected
Cyclohexane	6.0	21	Not Detected	Not Detected
1,4-Dioxane	6.0	22	Not Detected	Not Detected
Bromodichloromethane	6.0	40	Not Detected	Not Detected
4-Methyl-2-pentanone	6.0	25	Not Detected	Not Detected
2-Hexanone	6.0	25	Not Detected	Not Detected
Dibromochloromethane	6.0	52	Not Detected	Not Detected
Bromoform	6.0	63	Not Detected	Not Detected
4-Ethyltoluene	6.0	30	Not Detected	Not Detected
Ethanol	6.0	11	33	63
Methyl tert-Butyl Ether	6.0	22	17	62
Heptane	6.0	25	Not Detected	Not Detected
Acrylonitrile	6.0	13	Not Detected	Not Detected
3-Chloropropane	6.0	19	Not Detected	Not Detected
Ethyl Acetate	6.0	22	Not Detected	Not Detected
Isooctane	15	71	Not Detected	Not Detected
Vinyl Bromide	15	66	Not Detected	Not Detected

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	107	70-130
4-Bromofluorobenzene	91	70-130

# AIR TOXICS LTD.

SAMPLE NAME: 0119866

ID#: XXXXXXXXXX

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	c050412	Date of Collection:	4/24/01
Dil. Factor:	2.30	Date of Analysis:	5/4/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	1.2	5.8	Not Detected	Not Detected
Freon 114	1.2	8.2	Not Detected	Not Detected
Chloromethane	1.2	2.4	Not Detected	Not Detected
Vinyl Chloride	1.2	3.0	Not Detected	Not Detected
Bromomethane	1.2	4.5	Not Detected	Not Detected
Chloroethane	1.2	3.1	Not Detected	Not Detected
Freon 11	1.2	6.6	Not Detected	Not Detected
1,1-Dichloroethene	1.2	4.6	Not Detected	Not Detected
Freon 113	1.2	9.0	Not Detected	Not Detected
Methylene Chloride	1.2	4.1	11	40
1,1-Dichloroethane	1.2	4.7	Not Detected	Not Detected
cis-1,2-Dichloroethane	1.2	4.6	Not Detected	Not Detected
Chloroform	1.2	5.7	Not Detected	Not Detected
1,1,1-Trichloroethane	1.2	6.4	Not Detected	Not Detected
Carbon Tetrachloride	1.2	7.4	Not Detected	Not Detected
Benzene	1.2	3.7	2.6	8.3
1,2-Dichloroethane	1.2	4.7	Not Detected	Not Detected
Trichloroethene	1.2	6.3	Not Detected	Not Detected
1,2-Dichloropropane	1.2	5.4	Not Detected	Not Detected
cis-1,3-Dichloropropane	1.2	5.3	Not Detected	Not Detected
Toluene	1.2	4.4	15	57
trans-1,3-Dichloropropane	1.2	5.3	Not Detected	Not Detected
1,1,2-Trichloroethane	1.2	6.4	Not Detected	Not Detected
Tetrachloroethene	1.2	7.9	Not Detected	Not Detected
Ethylene Dibromide	1.2	9.0	Not Detected	Not Detected
Chlorobenzene	1.2	5.4	Not Detected	Not Detected
Ethyl Benzene	1.2	5.1	2.3	10
m,p-Xylene	1.2	5.1	8.5	37
o-Xylene	1.2	5.1	3.9	17
Styrene	1.2	5.0	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	1.2	8.0	Not Detected	Not Detected
1,3,5-Trimethylbenzene	1.2	5.7	Not Detected	Not Detected
1,2,4-Trimethylbenzene	1.2	5.7	2.9	14
1,3-Dichlorobenzene	1.2	7.0	Not Detected	Not Detected
1,4-Dichlorobenzene	1.2	7.0	Not Detected	Not Detected
Chlorotoluene	1.2	6.0	Not Detected	Not Detected
1,2-Dichlorobenzene	1.2	7.0	Not Detected	Not Detected
1,2,4-Trichlorobenzene	1.2	8.7	Not Detected	Not Detected
Hexachlorobutadiene	1.2	12	Not Detected	Not Detected
Propylene	4.6	8.0	Not Detected	Not Detected
1,3-Butadiene	4.6	10	Not Detected	Not Detected
Acetone	4.6	11	Not Detected	Not Detected

**AIR TOXICS LTD.**

SAMPLE NAME: [REDACTED]

ID#: [REDACTED]

**EPA METHOD TO-15 GC/MS FULL SCAN**

File Name:	c050412	Date of Collection:	4/24/01
Dil. Factor:	2.30	Date of Analysis:	5/4/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Carbon Disulfide	4.6	14	Not Detected	Not Detected
2-Propanol	4.6	11	89	220
trans-1,2-Dichloroethene	4.6	18	Not Detected	Not Detected
Vinyl Acetate	4.6	16	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	4.6	14	Not Detected	Not Detected
Hexane	4.6	16	9.4	34
Tetrahydrofuran	4.6	14	Not Detected	Not Detected
Cyclohexane	4.6	16	Not Detected	Not Detected
1,4-Dioxane	4.6	17	Not Detected	Not Detected
Bromodichloromethane	4.6	31	Not Detected	Not Detected
4-Methyl-2-pentanone	4.6	19	Not Detected	Not Detected
2-Hexanone	4.6	19	Not Detected	Not Detected
Dibromochloromethane	4.6	40	Not Detected	Not Detected
Bromoform	4.6	48	Not Detected	Not Detected
4-Ethyltoluene	4.6	23	2.7	13
Ethanol	4.6	8.8	33	64
Methyl tert-Butyl Ether	4.6	17	30	110
Heptane	4.6	19	Not Detected	Not Detected
Acrylonitrile	4.6	10	Not Detected	Not Detected
3-Chloropropene	4.6	15	Not Detected	Not Detected
Ethyl Acetate	4.6	17	Not Detected	Not Detected
Isooctane	12	55	Not Detected	Not Detected
Vinyl Bromide	12	51	Not Detected	Not Detected

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	98	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	94	70-130

# AIR TOXICS LTD.

SAMPLE NAME: XXXXXXXXXX

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	c050413	Date of Collection: 4/24/01
Dil. Factor:	2.30	Date of Analysis: 5/4/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	1.2	5.8	Not Detected	Not Detected
Freon 114	1.2	8.2	Not Detected	Not Detected
Chloromethane	1.2	2.4	Not Detected	Not Detected
Vinyl Chloride	1.2	3.0	Not Detected	Not Detected
Bromomethane	1.2	4.5	Not Detected	Not Detected
Chloroethane	1.2	3.1	Not Detected	Not Detected
Freon 11	1.2	6.6	1.7	9.8
1,1-Dichloroethane	1.2	4.6	Not Detected	Not Detected
Freon 113	1.2	9.0	Not Detected	Not Detected
Methylene Chloride	1.2	4.1	Not Detected	Not Detected
1,1-Dichloroethane	1.2	4.7	Not Detected	Not Detected
cis-1,2-Dichloroethane	1.2	4.6	8.6	35
Chloroform	1.2	5.7	Not Detected	Not Detected
1,1,1-Trichloroethane	1.2	6.4	Not Detected	Not Detected
Carbon Tetrachloride	1.2	7.4	Not Detected	Not Detected
Benzene	1.2	3.7	Not Detected	Not Detected
1,2-Dichloroethane	1.2	4.7	Not Detected	Not Detected
Trichloroethane	1.2	6.3	12	67
1,2-Dichloropropane	1.2	5.4	Not Detected	Not Detected
cis-1,3-Dichloropropene	1.2	5.3	Not Detected	Not Detected
Toluene	1.2	4.4	4.1	18
trans-1,3-Dichloropropene	1.2	5.3	Not Detected	Not Detected
1,1,2-Trichloroethane	1.2	6.4	Not Detected	Not Detected
Tetrachloroethane	1.2	7.9	Not Detected	Not Detected
Ethylene Dibromide	1.2	9.0	Not Detected	Not Detected
Chlorobenzene	1.2	5.4	Not Detected	Not Detected
Ethyl Benzene	1.2	5.1	Not Detected	Not Detected
m,p-Xylene	1.2	5.1	1.6	7.0
o-Xylene	1.2	5.1	Not Detected	Not Detected
Styrene	1.2	5.0	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	1.2	8.0	Not Detected	Not Detected
1,3,5-Trimethylbenzene	1.2	5.7	Not Detected	Not Detected
1,2,4-Trimethylbenzene	1.2	5.7	Not Detected	Not Detected
1,3-Dichlorobenzene	1.2	7.0	Not Detected	Not Detected
1,4-Dichlorobenzene	1.2	7.0	9.0	55
Chlorotoluene	1.2	6.0	Not Detected	Not Detected
1,2-Dichlorobenzene	1.2	7.0	Not Detected	Not Detected
1,2,4-Trichlorobenzene	1.2	8.7	Not Detected	Not Detected
Hexachlorobutadiene	1.2	12	Not Detected	Not Detected
Propylene	4.6	8.0	Not Detected	Not Detected
1,3-Butadiene	4.6	10	Not Detected	Not Detected
Acetone	4.6	11	20	50

**AIR TOXICS LTD.**SAMPLE NAME: XXXXXXXXXX

ID#: 0105019-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	c050413	Date of Collection:	4/24/01
Dil. Factor:	2.30	Date of Analysis:	5/4/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Carbon Disulfide	4.6	14	Not Detected	Not Detected
2-Propanol	4.6	11	35	87
trans-1,2-Dichloroethene	4.6	18	Not Detected	Not Detected
Vinyl Acetate	4.6	16	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	4.6	14	Not Detected	Not Detected
Hexane	4.6	16	Not Detected	Not Detected
Tetrahydrofuran	4.6	14	Not Detected	Not Detected
Cyclohexane	4.6	16	Not Detected	Not Detected
1,4-Dioxane	4.6	17	Not Detected	Not Detected
Bromodichloromethane	4.6	31	Not Detected	Not Detected
4-Methyl-2-pentanone	4.6	19	Not Detected	Not Detected
2-Hexanone	4.6	19	Not Detected	Not Detected
Dibromochloromethane	4.6	40	Not Detected	Not Detected
Bromoform	4.6	48	Not Detected	Not Detected
4-Ethyltoluene	4.6	23	Not Detected	Not Detected
Ethanol	4.6	8.8	180	340
Methyl tert-Butyl Ether	4.6	17	Not Detected	Not Detected
Heptane	4.6	19	Not Detected	Not Detected
Acrylonitrile	4.6	10	Not Detected	Not Detected
3-Chloropropene	4.6	15	Not Detected	Not Detected
Ethyl Acetate	4.6	17	16	57
Isooctane	12	55	Not Detected	Not Detected
Vinyl Bromide	12	51	Not Detected	Not Detected

Container Type: 6 Liter Summa Canister

Surrogates	% Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	93	70-130

# AIR TOXICS LTD.

SAMPLE NAME: XXXXXXXXXX

ID#: 0105019-04A

EPA METHOD TO-15 GC/MS PULL SCAN

File Name:	c050414	Date of Collection: 4/24/01
DJI. Factor:	2.23	Date of Analysis: 5/4/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	1.1	5.6	Not Detected	Not Detected
Freon 114	1.1	7.9	Not Detected	Not Detected
Chloromethane	1.1	2.3	Not Detected	Not Detected
Vinyl Chloride	1.1	2.9	Not Detected	Not Detected
Bromomethane	1.1	4.4	Not Detected	Not Detected
Chloroethane	1.1	3.0	Not Detected	Not Detected
Freon 11	1.1	6.4	1.3	7.4
1,1-Dichloroethene	1.1	4.5	Not Detected	Not Detected
Freon 113	1.1	8.7	Not Detected	Not Detected
Methylene Chloride	1.1	3.9	Not Detected	Not Detected
1,1-Dichloroethane	1.1	4.6	Not Detected	Not Detected
cis-1,2-Dichloroethene	1.1	4.5	Not Detected	Not Detected
Chloroform	1.1	5.5	Not Detected	Not Detected
1,1,1-Trichloroethane	1.1	6.2	Not Detected	Not Detected
Carbon Tetrachloride	1.1	7.1	Not Detected	Not Detected
Benzene	1.1	3.6	2.1	6.9
1,2-Dichloroethane	1.1	4.6	Not Detected	Not Detected
Trichloroethene	1.1	6.1	Not Detected	Not Detected
1,2-Dichloropropane	1.1	5.2	Not Detected	Not Detected
cis-1,3-Dichloropropene	1.1	5.1	Not Detected	Not Detected
Toluene	1.1	4.3	5.0	19
trans-1,3-Dichloropropene	1.1	5.1	Not Detected	Not Detected
1,1,2-Trichloroethane	1.1	6.2	Not Detected	Not Detected
Tetrachloroethene	1.1	7.7	Not Detected	Not Detected
Ethylene Dibromide	1.1	8.7	Not Detected	Not Detected
Chlorobenzene	1.1	5.2	Not Detected	Not Detected
Ethyl Benzene	1.1	4.9	Not Detected	Not Detected
m,p-Xylene	1.1	4.9	1.4	6.4
o-Xylene	1.1	4.9	Not Detected	Not Detected
Styrene	1.1	4.8	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	1.1	7.8	Not Detected	Not Detected
1,3,5-Trimethylbenzene	1.1	5.6	Not Detected	Not Detected
1,2,4-Trimethylbenzene	1.1	5.6	Not Detected	Not Detected
1,3-Dichlorobenzene	1.1	6.8	Not Detected	Not Detected
1,4-Dichlorobenzene	1.1	6.8	Not Detected	Not Detected
Chlorotoluene	1.1	5.9	Not Detected	Not Detected
1,2-Dichlorobenzene	1.1	6.8	Not Detected	Not Detected
1,2,4-Trichlorobenzene	1.1	8.4	Not Detected	Not Detected
Hexachlorobutadiene	1.1	12	Not Detected	Not Detected
Propylene	4.5	7.8	Not Detected	Not Detected
1,3-Butadiene	4.5	10	Not Detected	Not Detected
Acetone	4.5	11	110	260

**AIR TOXICS LTD.**SAMPLE NAME: XXXXXXXXXX

ID#: 0105019-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	c050414	Date of Collection:	4/24/01
Dil. Factor:	2.23	Date of Analysis:	5/4/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Carbon Disulfide	4.5	14	Not Detected	Not Detected
2-Propanol	4.5	11	380	960
trans-1,2-Dichloroethene	4.5	18	Not Detected	Not Detected
Vinyl Acetate	4.5	16	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	4.5	13	Not Detected	Not Detected
Hexane	4.5	16	9.2	33
Tetrahydrofuran	4.5	13	Not Detected	Not Detected
Cyclohexane	4.5	16	4.8	17
1,4-Dioxane	4.5	16	Not Detected	Not Detected
Bromodichloromethane	4.5	30	Not Detected	Not Detected
4-Methyl-2-pentanone	4.5	18	Not Detected	Not Detected
2-Hexanone	4.5	18	Not Detected	Not Detected
Dibromochloromethane	4.5	39	Not Detected	Not Detected
Bromoform	4.5	47	Not Detected	Not Detected
4-Ethyltoluene	4.5	22	Not Detected	Not Detected
Ethanol	4.5	8.5	200	380
Methyl tert-Butyl Ether	4.5	16	Not Detected	Not Detected
Heptane	4.5	18	5.0	21
Acrylonitrile	4.5	9.8	Not Detected	Not Detected
3-Chloropropene	4.5	14	Not Detected	Not Detected
Ethyl Acetate	4.5	16	5.5	20
Isooctane	11	53	Not Detected	Not Detected
Vinyl Bromide	11	50	Not Detected	Not Detected

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	95	70-130

# AIR TOXICS LTD.

SAMPLE NAME: XXXXXXXXXX

ID#: 0105019-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	c050416	Date of Collection: 4/24/01
Dil. Factor:	2.30	Date of Analysis: 5/4/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	1.2	5.8	Not Detected	Not Detected
Freon 114	1.2	8.2	Not Detected	Not Detected
Chloromethane	1.2	2.4	Not Detected	Not Detected
Vinyl Chloride	1.2	3.0	Not Detected	Not Detected
Bromomethane	1.2	4.5	Not Detected	Not Detected
Chloroethane	1.2	3.1	Not Detected	Not Detected
Freon 11	1.2	6.6	Not Detected	Not Detected
1,1-Dichloroethene	1.2	4.6	Not Detected	Not Detected
Freon 113	1.2	9.0	Not Detected	Not Detected
Methylene Chloride	1.2	4.1	1.4	5.0
1,1-Dichloroethane	1.2	4.7	Not Detected	Not Detected
cis-1,2-Dichloroethene	1.2	4.6	Not Detected	Not Detected
Chloroform	1.2	5.7	Not Detected	Not Detected
1,1,1-Trichloroethane	1.2	6.4	Not Detected	Not Detected
Carbon Tetrachloride	1.2	7.4	Not Detected	Not Detected
Benzene	1.2	3.7	Not Detected	Not Detected
1,2-Dichloroethane	1.2	4.7	Not Detected	Not Detected
Trichloroethene	1.2	6.3	Not Detected	Not Detected
1,2-Dichloropropane	1.2	5.4	Not Detected	Not Detected
cis-1,3-Dichloropropene	1.2	5.3	Not Detected	Not Detected
Toluene	1.2	4.4	3.2	12
trans-1,3-Dichloropropane	1.2	5.3	Not Detected	Not Detected
1,1,2-Trichloroethane	1.2	6.4	Not Detected	Not Detected
Tetrachloroethene	1.2	7.9	Not Detected	Not Detected
Ethylene Dibromide	1.2	9.0	Not Detected	Not Detected
Chlorobenzene	1.2	5.4	Not Detected	Not Detected
Ethyl Benzene	1.2	6.1	Not Detected	Not Detected
m,p-Xylene	1.2	5.1	Not Detected	Not Detected
o-Xylene	1.2	5.1	Not Detected	Not Detected
Styrene	1.2	5.0	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	1.2	8.0	Not Detected	Not Detected
1,3,5-Trimethylbenzene	1.2	5.7	Not Detected	Not Detected
1,2,4-Trimethylbenzene	1.2	5.7	Not Detected	Not Detected
1,3-Dichlorobenzene	1.2	7.0	Not Detected	Not Detected
1,4-Dichlorobenzene	1.2	7.0	Not Detected	Not Detected
Chlorotoluene	1.2	6.0	Not Detected	Not Detected
1,2-Dichlorobenzene	1.2	7.0	Not Detected	Not Detected
1,2,4-Trichlorobenzene	1.2	8.7	Not Detected	Not Detected
Hexachlorobutadiene	1.2	12	Not Detected	Not Detected
Propylene	4.6	8.0	Not Detected	Not Detected
1,3-Butadiene	4.6	10	Not Detected	Not Detected
Acetone	4.6	11	17	41

**AIR TOXICS LTD.**

SAMPLE NAME: [REDACTED]

ID#: 0105019-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	6060415	Date of Collection:	4/24/01
Dil. Factor:	2.30	Date of Analysis:	5/4/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Carbon Disulfide	4.6	14	Not Detected	Not Detected
2-Propanol	4.6	11	Not Detected	Not Detected
trans-1,2-Dichloroethene	4.6	18	Not Detected	Not Detected
Vinyl Acetate	4.6	16	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	4.6	14	Not Detected	Not Detected
Hexane	4.6	16	Not Detected	Not Detected
Tetrahydrofuran	4.6	14	Not Detected	Not Detected
Cyclohexane	4.6	16	Not Detected	Not Detected
1,4-Dioxane	4.6	17	Not Detected	Not Detected
Bromodichloromethane	4.6	31	Not Detected	Not Detected
4-Methyl-2-pentanone	4.6	19	Not Detected	Not Detected
2-Hexanone	4.6	19	Not Detected	Not Detected
Dibromochloromethane	4.6	40	Not Detected	Not Detected
Bromoform	4.6	48	Not Detected	Not Detected
4-Ethyltoluene	4.6	23	Not Detected	Not Detected
Ethanol	4.6	8.8	17	33
Methyl tert-Butyl Ether	4.6	17	Not Detected	Not Detected
Heptane	4.6	19	Not Detected	Not Detected
Acrylonitrile	4.6	10	Not Detected	Not Detected
3-Chloropropene	4.6	15	Not Detected	Not Detected
Ethyl Acetate	4.6	17	Not Detected	Not Detected
Isooctane	12	55	Not Detected	Not Detected
Vinyl Bromide	12	51	Not Detected	Not Detected

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	93	70-130

# AIR TOXICS LTD.

SAMPLE NAME: Lab Blank

ID#: XXXXXXXXXX

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	c050403	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 5/4/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.50	2.5	Not Detected	Not Detected
Freon 114	0.50	3.6	Not Detected	Not Detected
Chloromethane	0.50	1.0	Not Detected	Not Detected
Vinyl Chloride	0.50	1.3	Not Detected	Not Detected
Bromomethane	0.50	2.0	Not Detected	Not Detected
Chloroethane	0.50	1.3	Not Detected	Not Detected
Freon 11	0.50	2.8	Not Detected	Not Detected
1,1-Dichloroethane	0.50	2.0	Not Detected	Not Detected
Freon 113	0.50	3.9	Not Detected	Not Detected
Methylene Chloride	0.50	1.8	Not Detected	Not Detected
1,1-Dichloroethane	0.50	2.0	Not Detected	Not Detected
cis-1,2-Dichloroethane	0.50	2.0	Not Detected	Not Detected
Chloroform	0.50	2.5	Not Detected	Not Detected
1,1,1-Trichloroethane	0.50	2.8	Not Detected	Not Detected
Carbon Tetrachloride	0.50	3.2	Not Detected	Not Detected
Benzene	0.50	1.6	Not Detected	Not Detected
1,2-Dichloroethane	0.50	2.0	Not Detected	Not Detected
Trichloroethane	0.50	2.7	Not Detected	Not Detected
1,2-Dichloropropane	0.50	2.3	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected
Toluene	0.50	1.9	Not Detected	Not Detected
trans-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected
1,1,2-Trichloroethane	0.50	2.8	Not Detected	Not Detected
Tetrachloroethane	0.50	3.4	Not Detected	Not Detected
Ethylene Dibromide	0.50	3.9	Not Detected	Not Detected
Chlorobenzene	0.50	2.3	Not Detected	Not Detected
Ethyl Benzene	0.50	2.2	Not Detected	Not Detected
m,p-Xylene	0.50	2.2	Not Detected	Not Detected
o-Xylene	0.50	2.2	Not Detected	Not Detected
Styrene	0.50	2.2	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	0.50	3.5	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.50	2.5	Not Detected	Not Detected
1,2,4-Trimethylbenzene	0.50	2.5	Not Detected	Not Detected
1,3-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
1,4-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
Chlorotoluene	0.50	2.6	Not Detected	Not Detected
1,2-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
1,2,4-Trichlorobenzene	0.50	3.8	Not Detected	Not Detected
Hexachlorobutadiene	0.50	5.4	Not Detected	Not Detected
Propylene	2.0	3.5	Not Detected	Not Detected
1,3-Butadiene	2.0	4.5	Not Detected	Not Detected
Acetone	2.0	4.8	Not Detected	Not Detected

# AIR TOXICS LTD.

SAMPLE NAME: Lab Blank

ID#: 0105019-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	c050403	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 5/4/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Carbon Disulfide	2.0	6.3	Not Detected	Not Detected
2-Propanol	2.0	5.0	Not Detected	Not Detected
trans-1,2-Dichloroethene	2.0	8.0	Not Detected	Not Detected
Vinyl Acetate	2.0	7.2	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	6.0	Not Detected	Not Detected
Hexane	2.0	7.2	Not Detected	Not Detected
Tetrahydrofuran	2.0	6.0	Not Detected	Not Detected
Cyclohexane	2.0	7.0	Not Detected	Not Detected
1,4-Dioxane	2.0	7.3	Not Detected	Not Detected
Bromodichloromethane	2.0	14	Not Detected	Not Detected
4-Methyl-2-pentanone	2.0	8.3	Not Detected	Not Detected
2-Hexanone	2.0	8.3	Not Detected	Not Detected
Dibromochloromethane	2.0	17	Not Detected	Not Detected
Bromoform	2.0	21	Not Detected	Not Detected
4-Ethyltoluene	2.0	10	Not Detected	Not Detected
Ethanol	2.0	3.8	Not Detected	Not Detected
Methyl tert-Butyl Ether	2.0	7.3	Not Detected	Not Detected
Heptane	2.0	8.3	Not Detected	Not Detected
Acrylonitrile	2.0	4.4	Not Detected	Not Detected
3-Chloropropene	2.0	6.4	Not Detected	Not Detected
Ethyl Acetate	2.0	7.3	Not Detected	Not Detected
Isooctane	5.0	24	Not Detected	Not Detected
Vinyl Bromide	5.0	22	Not Detected	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	88	70-130

# Health Consultation

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Chicago Heights Blvd VOC Plume  
St. Louis County, Missouri  
MOSFN0703551  
SR Reference 7

Review of Basement Sampling Data

CHICAGO HEIGHTS BOULEVARD VOC PLUME SITE

OVERLAND, ST. LOUIS COUNTY, MISSOURI

AUGUST 8, 2001

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
Public Health Service  
Agency for Toxic Substances and Disease Registry  
Division of Health Assessment and Consultation  
Atlanta, Georgia 30333

### **Health Consultation: A Note of Explanation**

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

You May Contact ATSDR TOLL FREE at  
1-888-42ATSDR

or

Visit our Home Page at: <http://www.atsdr.cdc.gov>

**HEALTH CONSULTATION**

**Review of Basement Sampling Data**

**CHICAGO HEIGHTS BOULEVARD VOC PLUME SITE**

**OVERLAND, ST. LOUIS COUNTY, MISSOURI**

**Prepared by:**

**Missouri Department of Health  
Section for Environmental Public Health  
Under Cooperative Agreement with the  
Agency for Toxic Substances and Disease Registry**

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## Statement of Issues and Background

### Statement of Issues

The Missouri Department of Health (DOH), in cooperation with the Agency for Toxic Substances and Disease Registry (ATSDR), has prepared this health consultation at the request of the Missouri Department of Natural Resources (MDNR) to review basement sampling data collected from homes above a plume of volatile organic compounds (VOCs) at the Chicago Heights Boulevard VOC Plume site.

### Background

The Chicago Heights Boulevard VOC Plume site is located within a primarily residential area consisting of both multi-family and single-family dwellings (1). The site is approximately six square blocks, and is generally bounded by Meeks Boulevard to the north, Werremeyer Place to the east, Chicago Heights Boulevard to the south, and Elmridge Place to the west. The site is surrounded by various industrial and commercial businesses and lies within an unincorporated segment of St. Louis County, Missouri near the town of Overland (1). The site was discovered as a part of previous environmental investigations conducted of a nearby property known as EG&G Missouri Metals (EG&G) (1). Chlorinated solvents were found in the groundwater beneath a residential area located just south of the EG&G property, now known as the Chicago Heights Boulevard VOC Plume site (1).

Groundwater flow in the area appears to be in a southeasterly direction. Depth to groundwater is not well defined. In the northwest part of the site, the depth to bedrock is 19 feet. In that area, there is approximately 8 feet of native material overlain by 11 feet of fill. In an effort to determine whether EG&G was the source of the groundwater contamination in the residential area, several soil borings were conducted and subsequent soil and groundwater samples collected (1). The contaminants of concern consist primarily of tetrachloroethene (PCE) and trichloroethene (TCE), and their breakdown products (1).

A public water supply is in place at the site, and no one is known to be using groundwater for household purposes (1). Most basements in the area have sump pumps which collect water that has drained from around the outside of the house and/or has seeped into the basements through cracks in the foundations (1). Previous investigations found that residences with basements in the path of the VOC plume were subject to a potential threat from vapors emanating from contaminated groundwater entering the basements or from vapor migration through walls (1). MDNR, with concurrence of DOH, recommended air and water sampling in basements in the path of the plume to determine if contaminated groundwater was entering the basements (1).

MDNR conducted a site reassessment for the Chicago Heights Blvd. VOC Plume site on April 24, 2001 (1). During the reassessment, a total of seven homes were sampled for VOCs (1). Indoor air samples were collected in the basements of five homes using Summa Canisters for a period of 8 hours (1). Water samples were also collected from the sumps of three of these homes. Two additional homes had sumps sampled, but no indoor air sampling (1). All samples were analyzed for 82 volatile organic chemicals (1).

Table 1, in Appendix 1, lists the results of sample analysis for water samples collected. Table 2, in Appendix 1, lists the results of sample analysis for air samples collected. In regards to these tables, an MCL is a regulatory standard set by EPA, which represents the maximum permissible level of a contaminant in water that is delivered to the free-flowing outlet of the ultimate user of a public water system. EMEGs, which were developed by ATSDR, are Evaluation Guides that are specific to an Environmental Medium (air, water, soil), below which adverse health effects are unlikely. EMEGs are used by health assessors to screen out which chemicals are of concern and need further evaluation.

### **Discussion**

In the water samples collected from the sump pumps of five homes, only four chemicals, cis-1,2-dichloroethene (DCE), chloroform, trichloroethene (TCE), and tetrachloroethene (PCE), were detected. Sample results were compared to EPA's Maximum Contaminant Level for Drinking Water, which is a regulatory standard for public drinking water. Two of the samples exceeded these screening values. However, because this is water that was collected from basement sump-pumps it is unreasonable to believe that anyone would be drinking it. In addition, a public water supply is in place at the site, and no one is known to be using groundwater for household purposes. Therefore, exposure to contaminants at this site through ingestion is not expected to be of concern.

Because the chemicals detected in the sump-pump water are known to volatilize into air, air samples were collected in five basements. Of the four chemicals detected in sump-pump water, only two were detected in basement air, TCE and DCE. TCE results were compared to the chronic exposure EMEG for TCE in air. All of the basement air samples that detected TCE were at levels below the EMEG and are therefore unlikely to cause adverse health effects. ATSDR has not developed an EMEG for DCE in air. Another screening tool used by ATSDR and DOH to determine if health effects are likely to occur from chemical exposures are Reference doses. A Reference dose is the daily dose of a chemical found in a specific medium (e.g., air, water, soil) that levels below which are unlikely to cause adverse health effects. The calculated dose for DCE in basement air was several orders of magnitude below the reference dose, and therefore adverse health effects are not likely to occur from exposures to DCE-contaminated basement air.

In addition to the four chemicals found in sump pump water, basement air sampling detected a number of other VOC-contaminants that are listed in Table 2. Although these chemicals are not believed to be related to the site, DOH compared the levels found in basement air to chronic exposure EMEGs and reference doses for each contaminant, to determine if they were of health concern. None of the chemicals detected in basement air were found to be above an EMEG or a Reference dose, and therefore are not at levels of health concern. Many of the chemicals that were detected in basement air are constituents of common household and yard items such as gasoline, paints and paint thinners and other solvents. Although the sources of these contaminants are unknown at this time, they may be household items that are being stored in the basements of the individual homes. Because DOH recommends that people not voluntarily expose themselves to hazardous chemicals, it may be prudent for homeowners to remove or

relocate any solvents from their basements that are unnecessarily contributing to VOC-contamination in basement air.

Although the Site Reassessment and sampling event were conducted in the spring, when it is presumed that the ground is most saturated, it is difficult to determine if the samples collected during this event are representative of conditions in basements above the VOC plume year-round at this site. Further sampling may be necessary to determine if seasonal variations have an effect on VOC-contaminant concentrations in basement air and sump-pump water.

### **Children's Health**

Potential exposures to children were considered in developing this consult. Because all chemicals were detected below levels of health concerns, health effects are not expected.

### **Conclusions**

The Chicago Heights Boulevard VOC Plume Site has been classified as a No Apparent Public Health Hazard. This conclusion is based on the following:

1. Contaminants that are believed to be attributable to the Chicago Heights Boulevard VOC Plume Site (DCE, TCE, PCE and Chloroform) detected in sump-pump water and/or basement air are not at levels expected to cause adverse health effects. Other VOC contaminants, from unknown sources, have been detected in basement air, but are also not at levels that are expected to cause adverse health effects.
2. Sources of some contaminants found in basement air during sampling are unknown. Determining the sources of these contaminants and eliminating them may be a way to reduce exposures to hazardous chemicals.
3. Further sampling may be necessary to determine if samples collected during the Site Reassessment are representative of year-round conditions in basements above the site.

### **Recommendations**

1. Determine the sources of VOC-contaminants in basement air to reduce or eliminate unnecessary exposures.
2. Consider conducting further sampling to determine if samples collected during the Site Reassessment are representative of year-round conditions in basements above the site.

## **Public Health Action Plan**

This Public Health Action Plan (PHAP) for the Chicago Heights Boulevard VOC Plume site contains a description of actions to be taken by the Missouri Department of Health (DOH), the Agency for Toxic Substances and Disease Registry (ATSDR), and others. The purpose of the PHAP is to ensure that this health consultation not only identifies public health hazards, but also provides an action plan to mitigate and prevent adverse human health effects resulting from past, present, and/or future exposures to hazardous substances at or near the site. Included is a commitment from DOH and/or ATSDR to follow up on this plan to ensure that it is implemented. The public health actions to be implemented by DOH, ATSDR and/or cooperators are as follows:

### **Ongoing Activities**

1. DOH/ATSDR will coordinate with the appropriate environmental agencies to assure that recommendations in this health consultation are implemented.
2. DOH/ATSDR will coordinate with the appropriate environmental agencies to continue to address community health concerns as they arise.

### **Future Activity**

DOH/ATSDR will evaluate any further data that becomes available about human exposure or contaminants at this site.

### **Preparers of the Report:**

Sara Colboth and Scott Clardy, Missouri Department of Health.

### **Attachment:**

Appendix 1 – Tables 1 and 2

### **Reference**

1. Allen, Brian J., Site Reassessment Investigation Report, Chicago Heights Boulevard VOC Plume Site, Overland Missouri. Missouri Department of Natural Resources. 24 Apr 2001.

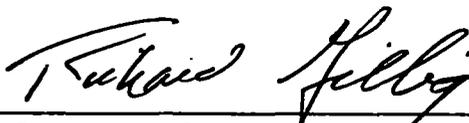
### Certification

This Chicago Heights Boulevard Health Consultation was prepared by the Missouri Department of Health under a cooperative agreement with the federal Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the health consultation was initiated.



Technical Project Officer, SPS, SSAB, DHAC

The Division of Health Assessment and Consultation (DHAC), ATSDR, has reviewed this health consultation and concurs with its findings.



Section Chief, SPS, SSAB, DHAC, ATSDR

Appendix 1

**Table 1**  
**Water Samples Collected From Basement Sumps**  
 All results in micrograms per Liter (ug/L) or  
 parts per billion (ppb)

Analytes	█	█	█	█	█	MCL
Cis-1,2-Dichloroethene	73.2	<1.0	83.7	<1.0	<1.0	70
Chloroform	<1.0	25.5	<1.0	<1.0	<1.0	80
Trichloroethene	1,140	<1.0	66.5	<1.0	<1.0	5
Tetrachloroethene	1.5	<1.0	<1.0	3.7	2.3	5

MCL = EPA's Maximum Contaminant Level for Public Drinking Water

**Table 2**  
**Air Samples Collected in Basements**  
 All results in parts per billion (ppb)

Analytes	█	█	█	█	█	EMEG
Acetone	8.1	<4.6	20.0	110.0	17	13,000
Chloroform	<1.5	<1.2	<1.2	<1.1	<1.2	20
Methylene Chloride	<1.5	11	<1.2	<1.1	1.4	300
Hexane	<6.0	9.4	<4.6	9.2	<4.6	600
Benzene	2.4	2.6	<1.2	2.1	<1.2	50
Trichloroethene	12	<1.2	12	<1.1	<1.2	100
Toluene	9.5	15	4.1	5.0	3.2	80
Tetrachloroethene	<1.5	<1.2	<1.2	<1.1	<1.2	None
Ethylbenzene	<1.5	2.3	<1.2	<1.1	<1.2	1000
Total Xylenes (m,p, and o)	5.3	12.4	<1.2	1.4	<1.2	100
cis-1,2-Dichloroethene	<1.5	<1.2	8.6	<1.1	<1.2	None
Methyl Tertiary Butyl Ether (MTBE)	17	30	<4.6	<4.5	<4.6	700

EMEG = Environmental Media Evaluation Guide for Chronic Exposure in Air.

DEPARTMENT OF NATURAL RESOURCES  
Division of Environmental Quality

TELEPHONE OR CONFERENCE RECORD

FILE: Chicago Heights Blvd VOC Plume Superfund Tech

DATE: December 12, 2001

TELEPHONE:

Incoming ( )  
Outgoing (X)

CONFERENCE:

Field ( )  
Office ( )

SUBJECT: Sump Pump Operation in Residences

PERSONS INVOLVED:

NAME

Nancy Priddy  
Mr. John Boley

REPRESENTING

DNR/HWP/Superfund  
Housing Authority of St. Louis Co.  
(314) 428-7948

SUMMARY OF CONVERSATION:

I called Mr. Boley to ask about sump pump operation in the residences south of Meeks Blvd at the Chicago Heights Blvd VOC Plume Site. I learned that external pipes drain water from beneath the basement floor and from around the foundation walls to reduce the water pressure that causes leakage into the basements. The water drains into the sumps inside the basements and then is pumped out of the sumps. The water leaving the sumps is disposed of in either of two ways. Some systems pump the water out through a drainpipe that goes some distance from the house and empties into a gravel-filled pit in the subsurface, where it percolates back into the ground. Other systems pump the water out through a drainpipe that empties into the street at the curb where the water eventually reaches the storm sewer. A site visit would probably be necessary to determine which system a specific residence uses.

  
Environmental Specialist

NHP:kc